COPPEI CREEK PROJECT AREA 07
WALLA WALLA COUNTY, WASHINGTON
30% DESIGN DRAWINGS

PREPARED FOR:
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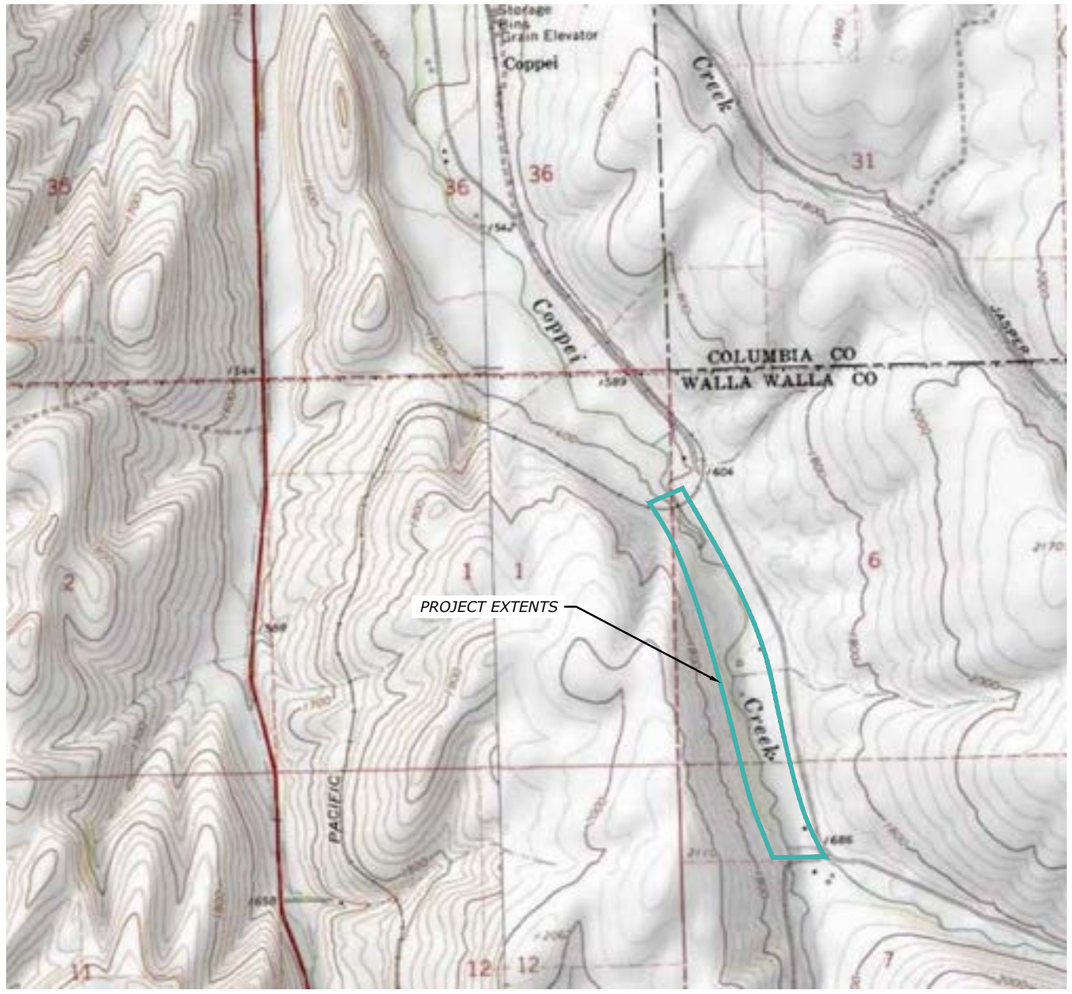
PROJECT LOCATION
THE PROJECT IS LOCATED ALONG THE MAIN STEM OF COPPEI CREEK DOWNSTREAM OF THE CONFLUENCE OF THE NORTH AND SOUTH FORK IN WALLA WALLA COUNTY, WASHINGTON, IN WRIA 32. IT CONSISTS OF PROJECT AREA C-7 OF UPPER COPPEI CREEK AS IDENTIFIED BY THE TOUCHET RIVER GEOMORPHIC ASSESSMENT (CCD, 2020). THE SEGMENT IS LOCATED BETWEEN RM 6.5 AND RM 8.11 (46.1904, -118.1103) UPSTREAM OF WAITSBURG.

SITE SUMMARY
T8N, R38E
WALLA WALLA COUNTY, WASHINGTON



VICINITY MAP
0 1000' 2000'

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29	D5	DETAILS - 5
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WORKING DRAFT FOR REVIEW AND REVISION

DATE: MARCH 1, 2023
DESIGNED: E. MILLER, S. BOX
APPROVED: J. FEALKO

DRAWING NAME
GENERAL

COVER

DRAWING NO.
G1
SHEET 1 OF 33

FILE: R:\PROJECTS\WALLA WALLA_NWS\3\COPPEI CR_WWCD\CAD\PRODUCTION\COPPEI_CREEK_GENERALS.DWG SAVED BY: TSICK PLOT DATE: 3/7/2023 2:23 PM

SUMMARY EXISTING CONDITIONS AND PROPOSED APPROACH

COPPEI CREEK AT THIS SITE IS A CONFINED, CONTINUOUS RIFFLE CHANNEL THAT LACKS COMPLEXITY, HABITAT DIVERSITY, AND FLOODPLAIN CONNECTIVITY RESULTING IN LIMITED HIGH-FLOW REFUGIA, POOR INSTREAM HABITAT COMPLEXITY, AND POOR JUVENILE REARING AND OVERWINTERING HABITAT FOR SALMONIDS.

THIS DESIGN WILL INCLUDE A SERIES OF TREATMENTS INCLUDING ENGINEERED LOG STRUCTURES, FLOODPLAIN RECONNECTIONS, SIDE CHANNEL ACTIVITATIONS AND RIPARIAN PLANTINGS TO BENEFIT MID-COLUMBIA SUMMER STEELHEAD, BULL TROUT AND REINTRODUCED SPRING CHINOOK SALMON.

IDENTIFIED FACTORS LIMITING HABITAT AND STREAM FUCTION

1. HIGH INSTREAM TEMPERATURES
2. EXCESSIVE SEDIMENT LOAD
3. CHANNEL INSTABILITY
4. INADEQUATE SUMMER FLOW
5. LACK OF HABITAT BIODIVERSITY
6. LACK OF KEY HABITAT QUANTITY (POOLS)
7. LACK OF LARGE WOODY MATERIAL
8. CHANNEL CONFINEMENT
9. POOR RIPARIAN FUNCTION

PROJECT GOAL AND OBJECTIVES

GOAL

1. IMPROVE RIVER AND FLOODPLAIN FUNCTIONS TO ENHANCE HABITAT DIVERSITY AND INCREASE THE CAPACITY OF THE PROJECT REACH TO SUPPORT JUVENILE LIFE STAGES OF CHINOOK SALMON AND STEELHEAD.

OBJECTIVES

1. INCREASE THE FREQUENCY OF POOL AND RIFFLE CHANNEL UNITS.
2. IMPROVE AND INCREASE THE QUANTITY AND QUALITY OF CONCEALMENT COVER AND INTERSTITIAL SPACES FOR JUVENILE FISH AT LOW FLOWS.
3. INCREASE AVAILABILITY OF REDUCED WATER VELOCITY (AND INCREASE DIVERSITY OF AVAILABLE VELOCITIES) ACROSS A BROAD RANGE OF FLOWS TO DECREASE FISH BIOENERGETIC DEMANDS.
4. DISTRIBUTE FLOW AND ENERGY ONTO THE FLOODPLAIN, THEREBY REDUCING STREAM POWER IN THE PRIMARY CHANNEL.
5. INCREASE DENSITY OF NATIVE RIPARIAN PLANT COMMUNITIES FOR IMPROVED SHADE AND BANK STABILITY.
6. DO NOT INCREASE FLOOD HAZARD RISK TO PRIVATE PROPERTY.

PROPOSED TREATMENTS

1. INSTREAM WOOD STRUCTURES AT OPPORTUNISTIC LOCATIONS TO:
   - INCREASE CHANNEL UNIT FREQUENCY
   - INCREASE LOCALIZED DEPOSITION AND SCOUR
   - INCREASE NATURAL WOOD RECRUITMENT
   - FACILITATE REACTIVATION OF RELIC SIDE CHANNELS
   - INCREASE HYDRAULIC DIVERSITY
   - INCREASE COVER FOR JUVENILES
2. GRADE CONTROL STRUCTURES AND CHANNEL SPANNING JAMS AT STRATEGIC LOCATIONS TO:
   - INCREASE FLOODPLAIN CONNECTIVITY
   - CREATE BACKWATERED BEDROCK POOLS FOR INCREASED DEPTH
   - ACTIVATE SECONDARY CHANNELS
   - INCREASE COVER FOR JUVENILES
   - INCREASE HYDRAULIC DIVERSITY
3. LEVEE REMOVAL AT STRATEGIC LOCATIONS TO:
   - INCREASE FLOODPLAIN ACTIVATION
   - REDUCE WATER VELOCITIES
4. RIPARIAN PLANTINGS IN AVULSION CHANNEL SEGMENT TO:
   - INCREASE SHADING FOR THERMAL BUFFERING
   - IMPROVE BANK STABILITY
   - INCREASE POTENTIAL FOR FUTURE LARGE WOOD RECRUITMENT
5. FLOOD HAZARD RISK MITIGATION TO:
   - REDUCE DAMAGE TO EXISTING INFRASTRUCTURE
   - REDUCE FUTURE EMERGENCY CHANNEL AUGMENTATION
   - RELOCATE AREA OF HEAVY EXPANSION AND DEPOSITION AWAY FROM INFRASTRUCTURE

MASTER LEGEND

- EXISTING CONTOUR (2-FT INTERVAL)
- PROPERTY LINE
- CONTROL POINT
- EXISTING OVERHEAD POWER
- EXISTING ROAD
- PHOTO LOCATION
- EXISTING LEVEE
- TEMPORARY ACCESS ROUTE
- TEMPORARY MATERIAL STOCKPILE AREA
- TEMPORARY STAGING AND REFUELING AREA
- TEMPORARY CROSSING
- PROPOSED CONTOUR (1-FT INTERVAL)
- CHANNEL THALWEG
- GRADING LIMIT
- EXISTING ORDINARY HIGH WATER
- PROPOSED 2-YR INUNDATION EXTENTS
- CHANNEL CUT
- CLASS 1 RIFFLE
- FLOODPLAIN CREATION
- WILLOW BAFFLE
- WOOD HABITAT STRUCTURE
- RIPARIAN PLANTING/SEEDING ZONE

ABBREVIATIONS

AC	ACRE
BMP	BEST MANAGEMENT PRACTICES
BO	BIOLOGICAL OPINION
BPA	BONNEVILLE POWER ADMINISTRATION
CFS	CUBIC FEET PER SECOND
CO/C.O.	CONTRACTING OFFICER
CP	CONTROL POINT
CSRO	COLUMBIA-SNAKE SALMON RECOVERY OFFICE
CWA	CLEAN WATER ACT
CY	CUBIC YARDS
DBH	DIAMETER AT BREAST HEIGHT
DEQ	DEPARTMENT ENVIRONMENTAL QUALITY
DSL	DEPARTMENT OF STATE LANDS
EA	EACH
E.	EAST
EL	ELEVATION
EPA	ENVIRONMENTAL PROTECTION AGENCY
ESA	ENDANGERED SPECIES ACT
FCRPS	FEDERAL COLUMBIA RIVER POWER SYSTEM
F.G.	FINISHED GRADE
HIP	HABITAT IMPROVEMENT PROGRAM
HWY	HIGHWAY
I	INTERSTATE
IDFG	IDAHO FISH & GAME
LWM	LARGE WOODY MATERIAL
MC	MAIN CHANNEL
MW	MONITORING WELL
N.	NORTH
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NEPA	NATIONAL ENVIRONMENTAL POLICY ACT
NMFS	NATIONAL MARINE FISHERIES SERVICE
NPDES	NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM
OC	ON CENTER
O.G.	ORIGINAL GRADE
OHW	ORDINARY HIGH WATER
OR	OREGON
OSHA	OCCUPATIONAL SAFTEY AND HEALTH ADMINISTRATION
PH	PHONE
PLS	PURE LIVE SEED
PLS/AC	PURE LIVE SEED PER ACRE
PP	PLAN AND PROFILE
R	RANGE
S.	SOUTH
SC	SIDE CHANNEL
SEC.	SECTION
SHPO	STATE HISTORIC PRESERVATION OFFICE
STA	STATION
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SY	SQUARE YARDS
T	TOWNSHIP
TESC	TEMPORARY EROSION & SEDIMENT CONTROL
TOB	TOP OF BANK
TYP	TYPICAL
U.S.	UNITED STATES
USACE	UNITED STATES ARMY CORPS OF ENGINEERS
USBR	UNITED STATE BUREAU OF RECLAMATION
USFS	UNITED STATES FOREST SERVICE
USFWS	UNITED STATES FISH & WILDLIFE SERVICE
V	VOLTS
W.	WEST
WSE	WATER SURFACE ELEVATION
YR	YEAR

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DRAWING NAME

GENERAL

GENERAL NOTES

DRAWING NO.

G2

SHEET 2 OF 33

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GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

THE ACTIVITIES COVERED UNDER THESE CONSERVATION MEASURES ARE INTENDED TO PROTECT AND RESTORE FISH AND WILDLIFE HABITAT WITH LONG-TERM BENEFITS TO FISH SPECIES. THE FOLLOWING GENERAL CONSERVATION MEASURES WILL BE APPLIED TO ALL ACTIONS OF THIS PROJECT.

PROJECT DESIGN AND SITE PREPARATION.

1. CONTAMINANTS.

A. IF CONTAMINATED SOILS ARE DISCOVERED, WORKERS SHOULD WITHDRAW TO A SAFE DISTANCE AND IMMEDIATELY NOTIFY THEIR MANAGER BEFORE PROCEEDING. THE MANAGER SHALL IMMEDIATELY NOTIFY THE SPONSOR.

B. ANY PERSON AUTHORIZED TO BE ONSITE SHALL HAVE THE RIGHT TO STOP WORK AT ANY TIME IF THE WORK ENVIRONMENT IS DETERMINED TO BE UNSAFE.

2. SITE LAYOUT AND FLAGGING.

A. CONSTRUCTION AREAS TO BE CLEARLY FLAGGED PRIOR TO CONSTRUCTION.

B. AREAS TO BE FLAGGED WILL INCLUDE:

1. SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER, SPAWNING AREAS, SPRINGS, AND WETLANDS;
2. EQUIPMENT ENTRY AND EXIT POINTS;
3. ROAD AND STREAM CROSSING ALIGNMENTS;
4. STAGING, STORAGE, AND STOCKPILE AREAS.

3. TEMPORARY STREAM CROSSINGS.

A. EXISTING STREAM CROSSINGS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER OF TEMPORARY STREAM CROSSINGS WILL BE MINIMIZED.

B. FOR PROJECTS THAT REQUIRE EQUIPMENT AND VEHICLES TO CROSS IN THE WET:

1. THE LOCATION AND NUMBER OF ALL WET CROSSINGS SHALL BE APPROVED BY THE CONTRACTING OFFICER AND DOCUMENTED IN THE CONSTRUCTION PLANS;
2. VEHICLES AND MACHINERY SHALL CROSS STREAMS AT RIGHT ANGLES TO THE MAIN CHANNEL WHENEVER POSSIBLE;
3. NO STREAM CROSSINGS WILL OCCUR 300 FEET UPSTREAM OR 100 FEET DOWNSTREAM OF AN EXISTING REDD OR SPAWNING FISH; AND
4. AFTER PROJECT COMPLETION, TEMPORARY STREAM CROSSINGS WILL BE OBLITERATED AND BANKS RESTORED.

4. TEMPORARY STAGING, STORAGE, AND STOCKPILE AREAS.

A. STAGING AREAS (USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, SERVICING, AND HAZARDOUS MATERIAL STORAGE) WILL BE 300 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND. STAGING AREAS CLOSER THAN 300 FEET SHALL BE APPROVED BY THE CONTRACTING OFFICER OR ENGINEER.

B. NATURAL MATERIALS USED FOR IMPLEMENTATION OF AQUATIC RESTORATION, SUCH AS LARGE WOOD, GRAVEL, AND BOULDERS, MAY BE STAGED WITHIN 100 FEET IF CLEARLY INDICATED IN THE PLANS THAT AREA IS FOR NATURAL MATERIALS ONLY.

C. ANY LARGE WOOD, TOPSOIL, AND NATIVE CHANNEL MATERIAL DISPLACED BY CONSTRUCTION WILL BE STOCKPILED FOR USE DURING SITE RESTORATION AT A SPECIFICALLY IDENTIFIED AND FLAGGED AREA.

D. ANY MATERIAL NOT USED IN RESTORATION, AND NOT NATIVE TO THE FLOODPLAIN, WILL BE DISPOSED OF IN A LOCATION APPROVED BY THE CONTRACTING OFFICER.

5. EQUIPMENT.

A. MECHANIZED EQUIPMENT AND VEHICLES WILL BE SELECTED, OPERATED, AND MAINTAINED IN A MANNER THAT MINIMIZES ADVERSE EFFECTS ON THE ENVIRONMENT (E.G., MINIMALLY-SIZED, LOW PRESSURE TIRES; MINIMAL HARD-TURN PATHS FOR TRACKED VEHICLES; TEMPORARY MATS OR PLATES WITHIN WET AREAS OR ON SENSITIVE SOILS).

B. EQUIPMENT WILL BE STORED AND MAINTAINED IN A CLEARLY IDENTIFIED STAGING AREA THAT MEETS STAGING AREA CONSERVATION MEASURES;

C. BIODEGRADABLE LUBRICANTS AND FLUIDS WILL BE USED ON EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER. SEE DRAWING G2 FOR REQUIREMENTS.

D. EQUIPMENT WILL BE INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 100 FEET OF ANY NATURAL WATER BODY OR WETLAND; AND

E. EQUIPMENT WILL BE THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

6. EROSION CONTROL.

A. TEMPORARY EROSION CONTROL MEASURES INCLUDE:

1. TEMPORARY EROSION CONTROLS WILL BE IN PLACE BEFORE ANY SIGNIFICANT ALTERATION OF THE ACTION SITE AND APPROPRIATELY INSTALLED DOWNSLOPE OF PROJECT ACTIVITY WITHIN THE RIPARIAN BUFFER AREA UNTIL SITE REHABILITATION IS COMPLETE;
2. IF THERE IS A POTENTIAL FOR ERODED SEDIMENT TO ENTER THE STREAM, SEDIMENT BARRIERS WILL BE INSTALLED AND MAINTAINED FOR THE DURATION OF PROJECT IMPLEMENTATION;
3. TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE SEDGE MATS, FIBER WATTLES, SILT FENCES, JUTE MATTING, WOOD FIBER MULCH AND SOIL BINDER, OR GEOTEXTILES AND GEOSYNTHETIC FABRIC;
4. SOIL STABILIZATION UTILIZING WOOD FIBER MULCH AND TACKIFIER (HYDRO-APPLIED) MAY BE USED TO REDUCE EROSION OF BARE SOIL IF THE MATERIALS ARE NOXIOUS WEED FREE AND NONTOXIC TO AQUATIC AND TERRESTRIAL ANIMALS, SOIL MICROORGANISMS, AND VEGETATION;
5. SEDIMENT WILL BE REMOVED FROM EROSION CONTROLS ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE CONTROL; AND
6. ONCE THE SITE IS STABILIZED AFTER CONSTRUCTION, TEMPORARY EROSION CONTROL MEASURES WILL BE REMOVED.

B. EMERGENCY EROSION CONTROLS. THE FOLLOWING MATERIALS FOR EMERGENCY EROSION CONTROL WILL BE AVAILABLE AT THE WORK SITE:

1. A SUPPLY OF SEDIMENT CONTROL MATERIALS; AND
2. AN OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER IS PRESENT.

7. DUST ABATEMENT.

A. SEE REQUIREMENTS ON DRAWING G3.

8. SPILL PREVENTION, CONTROL, AND COUNTERMEASURES.

A. A SPCC PLAN WILL BE PROVIDED TO THE CONTRACTOR. SEE THE REGULATORY REQUIREMENTS SECTION ON DRAWING G3.

B. A DESCRIPTION OF HAZARDOUS MATERIALS AND SAFETY DATA SHEETS (SDS) THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE PROVIDED TO THE CONTRACTING OFFICER IN ADVANCE AND BE AVAILABLE ON-SITE.

C. WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE AGENCIES WILL BE POSTED AT THE WORK SITE.

D. SPILL CONTAINMENT KITS (INCLUDING INSTRUCTIONS FOR CLEANUP AND DISPOSAL) ADEQUATE FOR THE TYPES AND QUANTITY OF HAZARDOUS MATERIALS USED AT THE SITE WILL BE AVAILABLE AT THE WORK SITE.

E. WORKERS WILL BE TRAINED IN SPILL CONTAINMENT PROCEDURES AND WILL BE INFORMED OF THE LOCATION OF SPILL CONTAINMENT KITS.

F. ANY WASTE LIQUIDS GENERATED AT THE STAGING AREAS WILL BE TEMPORARILY STORED UNDER AN IMPERVIOUS COVER, SUCH AS A TARPAULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.

G. PUMPS USED ADJACENT TO WATER SHALL USE SPILL CONTAINMENT SYSTEMS.

H. NO CHLORINATED SOLVENTS WILL BE UTILIZED OR BROUGHT INTO THE PROJECT SITE.

9. INVASIVE SPECIES CONTROL.

A. PRIOR TO ENTERING THE SITE, ALL VEHICLES AND EQUIPMENT WILL BE POWER WASHED, ALLOWED TO FULLY DRY, AND INSPECTED TO MAKE SURE NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERES TO THE SURFACE IN ACCORDANCE WITH THE SPONSOR'S WEED MANAGEMENT PLAN (ESOP-023).

B. WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES.

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HIP CONSERVATION MEASURES - 1

DRAWING NO.
G3
SHEET 3 OF 33

WORK AREA ISOLATION AND FISH SALVAGE.

1. WORK AREA ISOLATION.

A. ANY WORK AREA WITHIN THE WETTED CHANNEL WILL BE ISOLATED FROM THE ACTIVE STREAM WHENEVER ESA-LISTED FISH ARE REASONABLY CERTAIN TO BE PRESENT, OR IF THE WORK AREA IS LESS THAN 300-FEET UPSTREAM FROM KNOWN SPAWNING HABITATS.

B. WORK AREA ISOLATION AND FISH SALVAGE ACTIVITIES WILL COMPLY WITH THE APPROVED PROJECT PHASED ACTIVITIES.

C. DESIGN PLANS WILL INCLUDE ALL ISOLATION ELEMENTS AND AREAS (COFFER DAMS, PUMPS, DISCHARGE AREAS, FISH SCREENS, FISH RELEASE AREAS, ETC.).

D. WORK AREA ISOLATION AND FISH CAPTURE ACTIVITIES WILL OCCUR DURING PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE, NORMALLY EARLY IN THE MORNING VERSUS LATE IN THE DAY, AND DURING CONDITIONS APPROPRIATE TO MINIMIZE STRESS AND DEATH OF SPECIES PRESENT. ELECTROFISHING WILL NOT OCCUR WHEN WATER TEMPERATURES ARE ABOVE 15 DEGREES CELSIUS.

2. FISH SALVAGE (TO BE COORDINATED BY THE SPONSOR AND COMPLETED BY OTHERS).

A. MONITORING AND RECORDING WILL TAKE PLACE FOR DURATION OF SALVAGE. THE SALVAGE REPORT WILL BE COMMUNICATED TO AGENCIES VIA THE PROJECT COMPLETION FORM (PCF).

B. SALVAGE ACTIVITIES SHOULD TAKE PLACE DURING CONDITIONS TO MINIMIZE STRESS TO FISH SPECIES, TYPICALLY PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES WHICH OCCUR IN THE MORNING VERSUS LATE IN THE DAY.

C. SALVAGE OPERATIONS WILL FOLLOW THE ORDERING, METHODOLOGIES, AND CONSERVATION MEASURES SPECIFIED BELOW:

1. SLOWLY REDUCE WATER FROM THE WORK AREA TO ALLOW SOME FISH TO LEAVE VOLITIONALLY.
2. BLOCK NETS WILL BE INSTALLED AT UPSTREAM AND DOWNSTREAM LOCATIONS AND MAINTAINED IN A SECURED POSITION TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA.
3. BLOCK NETS WILL BE SECURED TO THE STREAM CHANNEL BED AND BANKS UNTIL FISH CAPTURE AND TRANSPORT ACTIVITIES ARE COMPLETE. BLOCK NETS MAY BE LEFT IN PLACE FOR THE DURATION OF THE PROJECT TO EXCLUDE FISH AS LONG AS PASSAGE REQUIREMENTS ARE MET.
4. NETS WILL BE MONITORED HOURLY DURING IN-STREAM DISTURBANCE.
5. IF BLOCK NETS REMAIN IN PLACE MORE THAN ONE DAY, THE NETS WILL BE MONITORED AT LEAST DAILY TO ENSURE THEY ARE SECURED AND FREE OF ORGANIC ACCUMULATION. IF BULL TROUT ARE PRESENT, NETS ARE TO BE CHECKED EVERY 4 HOURS FOR FISH IMPINGEMENT.
6. CAPTURE FISH THROUGH SEINING AND RELOCATE TO STREAMS.
7. WHILE DEWATERING, ANY REMAINING FISH WILL BE COLLECTED BY HAND OR DIP NETS.
8. USE SEINES WITH A MESH SIZE TO ENSURE CAPTURE OF THE RESIDING ESA-LISTED FISH.
9. MINNOW TRAPS WILL BE LEFT IN PLACE OVERNIGHT AND USED IN CONJUNCTION WITH SEINING.
10. ELECTROFISH TO CAPTURE AND RELOCATED FISH NOT CAUGHT DURING SEINING PER ELECTROFISH CONSERVATION MEASURES.
11. CONTINUE TO SLOWLY DEWATER STREAM REACH.
12. COLLECT ANY REMAINING FISH IN COLD-WATER BUCKETS AND RELOCATED TO THE STREAM.
13. LIMIT THE TIME FISH ARE IN A TRANSPORT BUCKET.
14. MINIMIZE PREDATION BY TRANSPORTING COMPARABLE SIZES IN BUCKETS.
15. BUCKET WATER TO BE CHANGED EVERY 15 MINUTES OR AERATED.
16. BUCKETS WILL BE KEPT IN SHADED AREAS OR COVERED.
17. DEAD FISH WILL NOT BE STORED IN TRANSPORT BUCKETS, BUT WILL BE LEFT ON THE STREAM BANK TO AVOID MORTALITY COUNTING ERRORS.

D. SALVAGE GUIDELINES FOR BULL TROUT, LAMPREY, MUSSELS, AND NATIVE FISH.

1. CONDUCT SITE SURVEY TO ESTIMATE SALVAGE NUMBERS.
2. PRE-SELECT SITE(S) FOR RELEASE.
3. SALVAGE OF BULL TROUT WILL NOT TAKE PLACE WHEN WATER TEMPERATURES EXCEED 15 DEGREES CELSIUS.
4. SEE ELECTROFISHING SECTION FOR APPROPRIATE SETTINGS FOR ELECTROFISHING EQUIPMENT.
5. REGULARLY INSPECT DEWATERED SITE.

3. ELECTROFISHING (TO BE COORDINATED BY THE SPONSOR AND COMPLETED BY OTHERS).

A. INITIAL SITE SURVEY AND INITIAL SETTINGS.

3. IDENTIFY SPAWNING ADULTS AND ACTIVE REDDS TO AVOID.
4. RECORD WATER TEMPERATURE.
5. ELECTROFISHING WILL NOT OCCUR WHEN WATER TEMPERATURES ARE ABOVE 15 DEGREES CELSIUS.
6. IF POSSIBLE, A BLOCK NET WILL BE PLACED DOWNSTREAM AND CHECKED REGULARLY TO CAPTURE STUNNED FISH THAT DRIFT DOWNSTREAM.
7. INITIAL SETTINGS WILL BE 100 VOLTS, PULSE WIDTH OF 500 MICRO SECONDS, AND PULSE RATE OF 30 HERTZ.
8. RECORDS FOR CONDUCTIVITY, WATER TEMPERATURE, AIR TEMPERATURE, ELECTROFISHING SETTINGS, ELECTROFISHER MODEL, ELECTROFISHER CALIBRATION, FISH CONDITIONS, FISH MORTALITIES, AND TOTAL CAPTURE RATES WILL BE INCLUDED IN THE SALVAGE LOG BOOK.

B. ELECTROFISHING TECHNIQUE.

1. SAMPLING WILL BEGIN USING STRAIGHT DC. POWER WILL REMAIN ON UNTIL THE FISH IS NETTED WHEN USING STRAIGHT DC. GRADUALLY INCREASE VOLTAGE WHILE REMAINING BELOW MAXIMUM LEVELS.
2. MAXIMUM VOLTAGE WILL BE 1100 VOLTS WHEN CONDUCTIVITY IS <100 MILLISECONDS, 800 VOLTS WHEN CONDUCTIVITY IS BETWEEN 100 AND 300 MILLISECONDS, AND 400 VOLTS WHEN CONDUCTIVITY IS >300 MILLISECONDS.
3. IF FISH CAPTURE IS NOT SUCCESSFUL USING STRAIGHT DC, THE ELECTROFISHER WILL BE SET TO INITIAL VOLTAGE FOR PDC. VOLTAGE, PULSE WIDTH, AND PULSE FREQUENCY WILL BE GRADUALLY INCREASED WITHIN MAXIMUM VALUES UNTIL CAPTURE IS SUCCESSFUL.
4. MAXIMUM PULSE WIDTH IS 5 MILLISECONDS. MAXIMUM PULSE RATE IS 70 HERTZ
5. ELECTROFISHING WILL NOT OCCUR IN ONE AREA FOR AN EXTENDED PERIOD.
6. THE ANODE WILL NOT INTENTIONALLY COME INTO CONTACT WITH FISH. THE ZONE FOR POTENTIAL INJURY OF 0.5 M FROM THE ANODE WILL BE AVOIDED.
7. USE LOWER SETTINGS IN SHALLOW WATER AS VOLTAGE GRADIENTS ARE LIKELY TO INCREASE.
8. ELECTROFISHING WILL NOT OCCUR IN TURBID WATER WHERE VISIBILITY IS POOR (I.E. UNABLE TO SEE THE BED OF THE STREAM).
9. OPERATIONS WILL IMMEDIATELY STOP IF MORTALITY OR OBVIOUS FISH INJURY IS OBSERVED. ELECTROFISHING SETTINGS WILL BE REEVALUATED.

C. SAMPLE PROCESSING.

1. FISH SHOULD BE SORTED BY SIZE TO AVOID PREDATION DURING SAMPLING.
2. SAMPLERS WILL REGULARLY CHECK CONDITIONS OF FISH HOLDING CONTAINERS, AIR PUMPS, WATER TRANSFERS, ETC.
3. FISH WILL BE OBSERVED FOR GENERAL CONDITIONS AND INJURIES
4. EACH FISH WILL BE COMPLETELY REVIVED BEFORE RELEASE. ESA-LISTED SPECIES WILL BE PRIORITIZED FOR SUCCESSFUL RELEASE.

4. DEWATERING.

D. DEWATERING WILL OCCUR AT A RATE SLOW ENOUGH TO ALLOW SPECIES TO NATURALLY MIGRATE OUT OF THE WORK AREA.

E. WHERE A GRAVITY FEED DIVERSION IS NOT POSSIBLE, A PUMP MAY BE USED. PUMPS WILL BE INSTALLED TO AVOID REPETIVE DEWATERING AND REWATERING.

F. WHEN FISH ARE PRESENT, PUMPS WILL BE SCREENED IN ACCORDANCE WITH NMFS SCREEN CRITERIA.

G. DISSIPATION OF FLOW ENERGY AT THE BYPASS OUTFLOW WILL BE PROVIDED TO PREVENT DAMAGE TO THE STREAM CHANNEL AND RIPARIAN VEGETATION.

H. SEEPAGE WATER WILL BE PUMPED TO A TEMPORARY STORAGE AND TREATMENT SITE OF INTO UPLAND AREAS TO ALLOW WATER TO PERCOLATE THROUGH SOIL AND VEGETATION PRIOR TO REENTERING THE STREAM CHANNEL.

CONSTRUCTION AND POST CONSTRUCTION CONSERVATION MEASURES.

1. FISH PASSAGE.

A. FISH PASSAGE WILL BE PROVIDED FOR ADULT AND JUVENILE FISH LIKELY TO BE PRESENT DURING CONSTRUCTION UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION, THE STREAM IS NATURALLY IMPASSABLE, OR PASSAGE WILL NEGATIVELY IMPACT ESA-LISTED SPECIES OR THEIR HABITAT.

B. FISH PASSAGE ALTERNATIVES WILL BE APPROVED BY THE CONTRACTING OFFICER UNDER ADVISEMENT BY APPROPRIATE REGULATORY AGENCIES.

2. CONSTRUCTION DISCHARGE WATER.

A. CONSTRUCTION DISCHARGE WATER WILL BE COLLECTED AND TREATED TO REMOVE DEBRIS AND SEDIMENT AND WILL MEET TURBIDITY REQUIREMENTS PRIOR TO DISCHARGING BACK TO RECEIVING STREAMS.

3. TIME AND EXTENT OF DISTURBANCE.

A. EARTHWORK REQUIRING IN-STREAM MECHANIZED EQUIPMENT (INCLUDING DRILLING, EXCAVATION, DREDGING, FILLING, AND COMPACTING) WILL BE COMPLETED AS QUICKLY AS POSSIBLE.

B. MECHANIZED EQUIPMENT WILL WORK FROM TOP OF BANK UNLESS WORK FROM ANOTHER LOCATION WILL RESULT IN LESS HABITAT DISTURBANCE (TURBIDITY, VEGETATION DISTURBANCE, ETC.).

4. CESSATION OF WORK.

A. PROJECT OPERATIONS WILL CEASE WHEN HIGH FLOW CONDITIONS MAY RESULT IN INUNDATION OF THE PROJECT AREA (FLOOD FIGHTING EFFORTS TO DECREASE DAMAGES TO NATURAL RESOURCES ARE PERMITTED) OR IF WATER QUALITY LEVELS (TURBIDITY) ARE EXCEEDED.

5. SITE RESTORATION.

A. DISTURBED AREAS, STREAM BANKS, SOILS, AND VEGETATION WILL BE CLEANED UP AND RESTORED TO IMPROVED OR PRE-PROJECT CONDITIONS.

B. PROJECT-RELATED WASTE WILL BE REMOVED.

C. TEMPORARY ACCESS ROADS AND STAGING WILL BE DECOMPACTED AND RESTORED. SOILS WILL BE LOOSENED IF NEEDED FOR REVEGETATION OR WATER INFILTRATION.

D. THE PROJECT SPONSOR WILL RETAIN THE RIGHT OF REASONABLE ACCESS TO THE SITE TO MONITOR AND MAINTAIN THE SITE OVER THE LIFE OF THE PROJECT.

6. REVEGETATION.

A. PLANTING AND SEEDING WILL OCCUR PRIOR TO OR AT THE BEGINNING OF THE FIRST GROWING SEASON AFTER CONSTRUCTION.

B. A MIX OF NATIVE SPECIES (INVASIVE SPECIES NOT ALLOWED) APPROPRIATE TO THE SITE WILL BE USED TO REESTABLISH VEGETATION, PROVIDE SHADE, AND REDUCE EROSION. REESTABLISHED VEGETATION SHOULD BE AT LEAST 70% OF PRE-PROJECT CONDITIONS WITHIN THREE YEARS.

C. VEGETATION SUCH AS WILLOWS, SEDGES, OR RUSH MATS WILL BE SALVAGED FROM DISTURBED OR ABANDONED AREAS TO BE REPLANTED.

D. SHORT-TERM STABILIZATION MEASURE MAY INCLUDE THE USE OF NON-NATIVE STERILE SEED MIX (WHEN NATIVE NOT AVAILABLE), WEED-FREE CERTIFIED STRAW, OR OTHER SIMILAR TECHNIQUES.

E. SURFACE FERTILIZER WILL NOT BE APPLIED WITHIN 50 FEET OF ANY STREAM, WATER BODY, OR WETLAND.

F. FENCING WILL BE INSTALLED AS NECESSARY TO PREVENT ACCESS TO REVEGETATED SITES BY LIVESTOCK OR UNAUTHORIZED PERSONS.

G. INVASIVE PLANTS WILL BE REMOVED OR CONTROLLED (BY THE SPONSOR) UNTIL NATIVE PLANT SPECIES ARE WELL ESTABLISHED (TYPICALLY THREE YEARS POST-CONSTRUCTION).

7. SITE ACCESS AND IMPLEMENTATION MONITORING.

A. THE PROJECT SPONSOR WILL PROVIDE CONSTRUCTION MONITORING DURING IMPLEMENTATION TO ENSURE ALL CONSERVATION MEASURES ARE ADEQUATELY FOLLOWED, EFFECTS TO LISTED SPECIES ARE NOT GREATER THAN PREDICTED, AND INCIDENTAL TAKE LIMITATIONS ARE NOT EXCEEDED.

8. STAGED REWATERING PLAN.

A. WHEN REINTRODUCING WATER TO DEWATERED AREAS AND NEWLY CONSTRUCTED CHANNELS, A STAGED REWATERING PLAN WILL BE APPLIED. REFER TO THE SPECIFICATIONS FOR REWATERING PROCEDURES. TURBIDITY MONITORING PROTOCOL WILL BE APPLIED TO REWATERING EFFORTS.

9. TURBIDITY MONITORING (TO BE PERFORMED BY THE SPONSOR).

A. THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL COMPLETE AND RECORD WATER QUALITY OBSERVATIONS TO ENSURE IN-WATER WORK IS NOT DEGRADING WATER QUALITY.

B. BACKGROUND READING: RECORD THE READING, LOCATION (LATITUDE AND LONGITUDE), DATE, AND TIME APPROXIMATELY 100 FEET UPSTREAM OF THE PROJECT AREA USING A RECENTLY CALIBRATED TURBIDIMETER.

C. COMPLIANCE POINT READING: RECORD THE READING, LOCATION (LATITUDE AND LONGITUDE), DATE, AND TIME AS FOLLOWS:

1. 50 FEET DOWNSTREAM FOR STREAMS LESS THAN 30 FEET WIDE.
2. 100 FEET DOWNSTREAM FOR STREAMS BETWEEN 30 AND 100 FEET WIDE.
3. 200 FEET DOWNSTREAM FOR STREAMS GREATER THAN 100 FEET WIDE.

D. TURBIDITY SHALL BE MEASURED AT THE BACKGROUND LOCATION AND COMPLIANCE POINTS EVERY 4 HOURS WHILE EARTH DISTURBING ACTIVITIES ARE OCCURING.

E. TURBIDIY EXCEEDS WATER QUALITY STANDARDS IF:

1. THE DIFFERENCE BETWEEN BACKGROUND AND THE COMPLIANCE POINT IS GREATER THAN 50 NTU.
2. THE DIFFERENCE BETWEEN BACKGROUND AND THE COMPLIANCE POINT IS GREATER THAN 25 NTU FOR 10 CONSECUTIVE DAYS.

F. IF TURBIDITY EXCEEDS WATER QUALITY STANDARDS, IMMEDIATELY STOP THE EARTH DISTURBING ACTIVITIES CAUSING THE EXCEEDANCE AND REPORT THE EXCEEDANCE TO THE IDEQ REGIONAL OFFICE WITHIN 24 HOURS.

G. IF TURBIDITY CONTROLS (COFFERDAMS, WATTLES, FENCING, ETC.) ARE DETERMINED INEFFECTIVE, THE CONTRACTOR SHALL MODIFY THE CONTROLS AS NECESSARY.

H. EARTH DISTURBING ACTIVITIES MAY CONTINUE ONCE TURBIDITY READINGS RETURN TO WITHIN 50 NTU OF BACKGROUND OR IF TURBIDITY NO LONGER EXCEEDS 25 NTU OVER BACKGROUND FOR AT LEAST 24 CONSECUTIVE HOURS.

I. COPIES OF DAILY LOGS FOR TURBIDITY MONITORING SHALL BE AVAILABLE TO IDEQ AND OTHER AGENCIES UPON REQUEST. THE REPORT MUST DESCRIBE ALL EXCEEDANCES AND SUBSEQUENT ACTIONS TAKEN, INCLUDING THE EFFECTIVENESS OF THE ACTION. THE TURBIDITY MONITORING LOGS WILL BE STORED AT PERPETUA'S ADMINISTRATION OFFICE LOCATED ADJACENT TO THE PROJECT SITE.

J. A POST-CONSTRUCTION TURBIDITY MONITORING REPORT WILL BE DEVELOPED IN ACCORDANCE WITH THE CQAP AND PROVIDED TO IDEQ AND AGENCIES AFTER CONSTRUCTION IS COMPLETE.

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COPPEI CREEK
WALLA WALLA COUNTY, WASHINGTON
NWS-2023-201 46.1902, -118.1108

WORKING DRAFT FOR REVIEW AND REVISION

DATE: MARCH 1, 2023
DESIGNED: E. MILLER, S. BOX
APPROVED: J. FEALKO

DRAWING NAME
GENERAL

HIP CONSERVATION MEASURES - 2

DRAWING NO.
G4
SHEET 4 OF 33

FILE: R:\PROJECTS\WALLA WALLA HUC5\COPPEI CR. WWCCD\PRODUCTION\COPPEI CREEK GENERAL.DWG SAVED BY: TSICK AT DATE: 3/7/2023 2:23 PM

QUANTITIES

ITEM DESCRIPTION	QUANTITY	UNIT	ASSUMPTIONS
GENERAL			
MOBILIZATION AND DEMOBILIZATION	1	LS	
SPCC PLAN DEVELOPMENT AND IMPLEMENTATION	1	LS	
ESC PLAN DEVELOPMENT AND IMPLEMENTATION	1	LS	
CONSTRUCTION AND DRIVEWAY ENTRANCE	5	EA	
STRAW WATTLES	600	LF	
CLEARING	0.46	AC	
COFFERDAMS, PUMPING, AND DEWATERING	1	LS	
SURVEYING	1	LS	
TEMPORARY STABILIZED ACCESS ROUTE	2,027	SY	WOOD CHIPS OR GRAVEL; 20% OF 7,600 LF
TEMPORARY LOG STREAM CROSSING	3	EA	
SITE WORK			
EXCAVATION	1,850	CY	
CHANNEL EXCAVATION	885	CY	
LEVEE EXCAVATION	965	CY	
OFF-SITE HAUL	1,850	CY	
CONSTRUCTED RIFFLE MATERIAL	50	CY	INCLUDES INSTALL
LWD ACQUISITION AND DELIVERY	1	LS	
HS-1 - THREE LOG STRUCTURE	14	EA	STRUCTURE INSTALL
HS-2 - SINGLE LOG STRUCTURE	197	EA	STRUCTURE INSTALL
HS-3 - WHOLE TREE STRUCTURE	52	EA	STRUCTURE INSTALL
HS-4 - BLEEDER JAM STRUCTURE	11	EA	STRUCTURE INSTALL
HS-5 - SMALL APEX JAM STRUCTURE	4	EA	STRUCTURE INSTALL
WILLOW BAFFLE	600	LF	STRUCTURE INSTALL
SOIL DECOMPACTION, PLANTING, AND SEEDING			
RIPARIAN SEEDING AND PLANTING	4.55	AC	

WOOD MATERIALS SUMMARY							
DESCRIPTION	DBH (IN)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY	UNIT
TYPE 1	13 - 22	30 - 40	YES	4.5	NO	280	EA
TYPE 2	13 - 22	30 - 40	NO	NA	NO	82	EA
TYPE 3	13 - 22	40 - 60	YES	4	YES	64	EA
TYPE 4	12 - 14	20 - 35	NO	NA	NO	4	EA
TYPE 5	13 - 22	40 - 50	YES	4.5	NO	11	EA
RACKING-1	4 - 12	15 - 25	YES	2.5	YES	72	EA
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	857	EA
SLASH-1	1 - 4	5 - 15	NA	NA	YES	1,100	EA
SLASH-2	1- 4	5 - 15	NA	NA	YES	240	EA
LIVE CUTTINGS	> 3/4	6 - 8	NA	NA	NA	2,522	EA

WOOD MATERIALS SUMMARY NOTES
1. MATERIAL SIZE AND LENGTH WILL BE REFINED IN A FUTURE DESIGN PHASE.

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QUANTITIES

DRAWING NO.
G5
SHEET 5 OF 33

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SURVEY CONTROL POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
102	321694.14	2245866.40	1695.75	CP PK NAIL
103	321943.75	2245696.45	1688.42	CP PK NAIL
104	322892.39	2245464.55	1669.61	CP PK NAIL
105	324382.57	2245261.30	1650.85	CP PK NAIL
106	325908.24	2244567.25	1622.28	CP PK NAIL
107	326577.03	2244279.68	1608.13	CP PK NAIL
100	322309.25	2245714.76	1712.46	CP 100 1/2 RBR RIO CAP
108	326258.64	2243738.40	1628.13	CP 1/2 RBR RIO CAP
109	324456.10	2244404.06	1658.60	CP 1/2 RBR RIO CAP
101	321596.39	2245320.61	1689.53	CP PK NAIL

NOTES

1. SEE PHOTOS CORRESPONDING TO PHOTO POINTS ON DRAWING C2.
2. INUNDATION EXTENTS SHOWN FOR THE ESTIMATED 2-YR FLOW EVENT FOR EXISTING CONDITIONS.
3. MINOR CONTOURS NOT SHOWN FOR CLARITY.

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EXISTING CONDITIONS
EXISTING OVERVIEW

DRAWING NO.
C1
SHEET 6 OF 33

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1 PHOTO 1. GABION BASKET LEVEE ON RIVER RIGHT AT UPSTREAM END

2 PHOTO 2. BEDROCK FEATURES LOCATED ACROSS ENTIRE CHANNEL WIDTH

3 PHOTO 3. RELIC V-NOTCH WEIR (ONE OF MULTIPLE) LOCATED THROUGHOUT THE PROJECT REACH

4 PHOTO 4. ALTERNATING BARS WITHIN OVERALL CHANNEL WIDTH

5 PHOTO 5. HIGH FLOW SIDE CHANNEL AND ASSOCIATED INLET

6 PHOTO 6. FLOOD RISK OF STRUCTURES LOCATED ON RIGHT BANK

7 PHOTO 7. HISTORIC CHANNEL ALIGNMENT WITHIN OLD CREP PLANTING ZONE

8 PHOTO 8. LATERAL MIGRATION WITHIN NEW CHANNEL SEGMENT WITH CREP WEED BARRIER VISIBLE ON LEFT SIDE OF PHOTO

9 PHOTO 9. VERTICAL CUT BANKS EXIST ON LEFT AND RIGHT BANKS

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EXISTING PHOTOS

DRAWING NO.

C2

SHEET 7 OF 33

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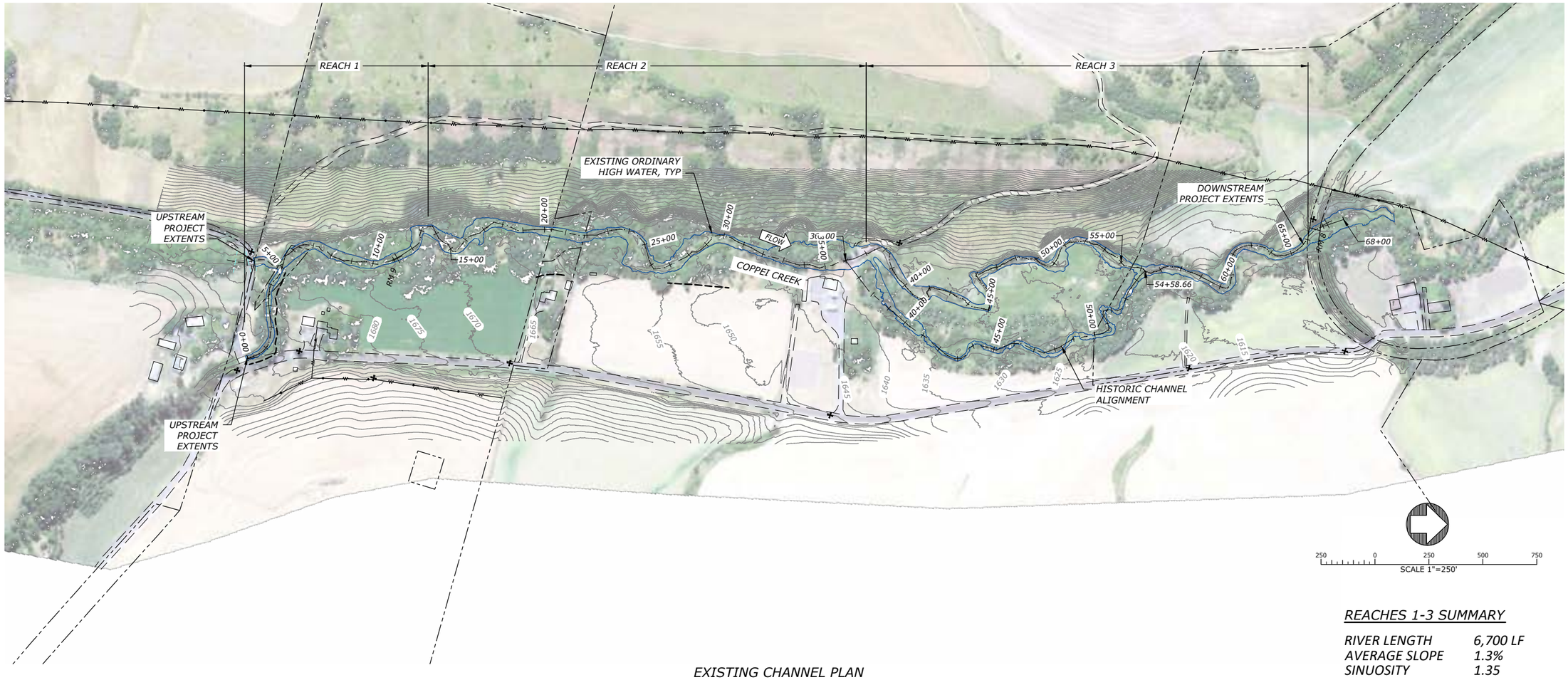
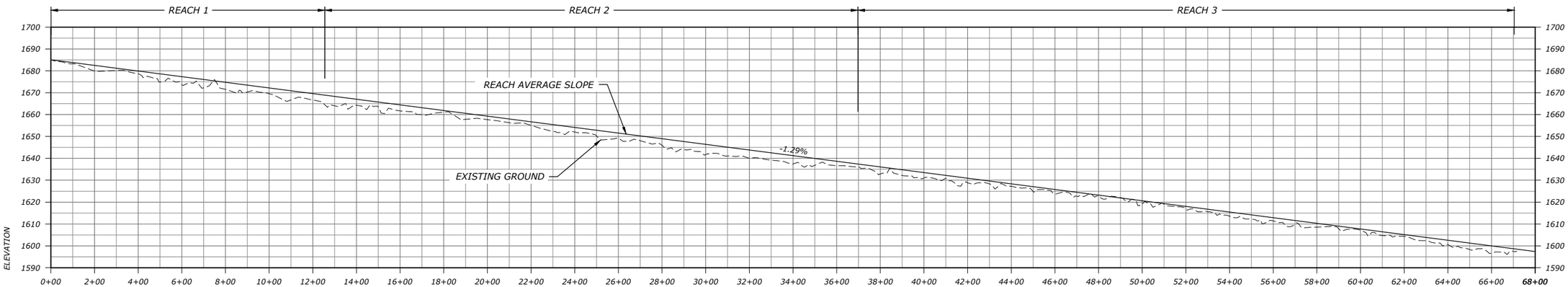


REACHES 1-3 SUMMARY

RIVER LENGTH	6,700 LF
AVERAGE SLOPE	1.3%
SINUOSITY	1.35

EXISTING CHANNEL PLAN

STA 0+00 TO 67+04



EXISTING CHANNEL PROFILE

STA 0+00 TO 67+04

HORIZONTAL SCALE
250 0 250 500 750
SCALE 1"=250'

VERTICAL SCALE
50 0 50 100 150
SCALE 1"=50'

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EXISTING CONDITIONS

EXISTING PLAN & PROFILE

DRAWING NO.
C3
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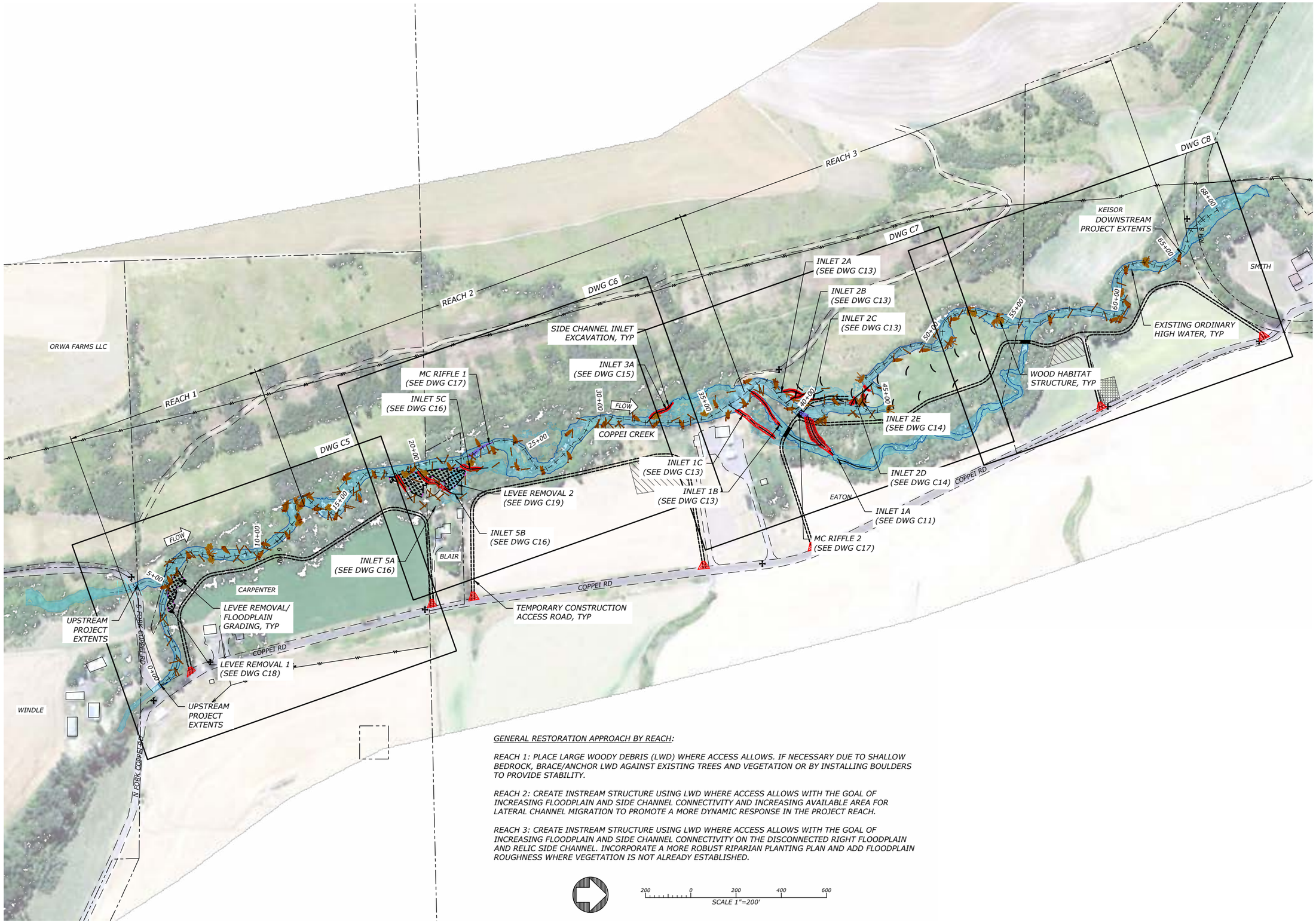

GENERAL RESTORATION APPROACH BY REACH:

REACH 1: PLACE LARGE WOODY DEBRIS (LWD) WHERE ACCESS ALLOWS. IF NECESSARY DUE TO SHALLOW BEDROCK, BRACE/ANCHOR LWD AGAINST EXISTING TREES AND VEGETATION OR BY INSTALLING BOULDERS TO PROVIDE STABILITY.

REACH 2: CREATE INSTREAM STRUCTURE USING LWD WHERE ACCESS ALLOWS WITH THE GOAL OF INCREASING FLOODPLAIN AND SIDE CHANNEL CONNECTIVITY AND INCREASING AVAILABLE AREA FOR LATERAL CHANNEL MIGRATION TO PROMOTE A MORE DYNAMIC RESPONSE IN THE PROJECT REACH.

REACH 3: CREATE INSTREAM STRUCTURE USING LWD WHERE ACCESS ALLOWS WITH THE GOAL OF INCREASING FLOODPLAIN AND SIDE CHANNEL CONNECTIVITY ON THE DISCONNECTED RIGHT FLOODPLAIN AND RELIC SIDE CHANNEL. INCORPORATE A MORE ROBUST RIPARIAN PLANTING PLAN AND ADD FLOODPLAIN ROUGHNESS WHERE VEGETATION IS NOT ALREADY ESTABLISHED.

200 0 200 400 600
SCALE 1"=200'

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PROPOSED OVERVIEW

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C4

SHEET 9 OF 33

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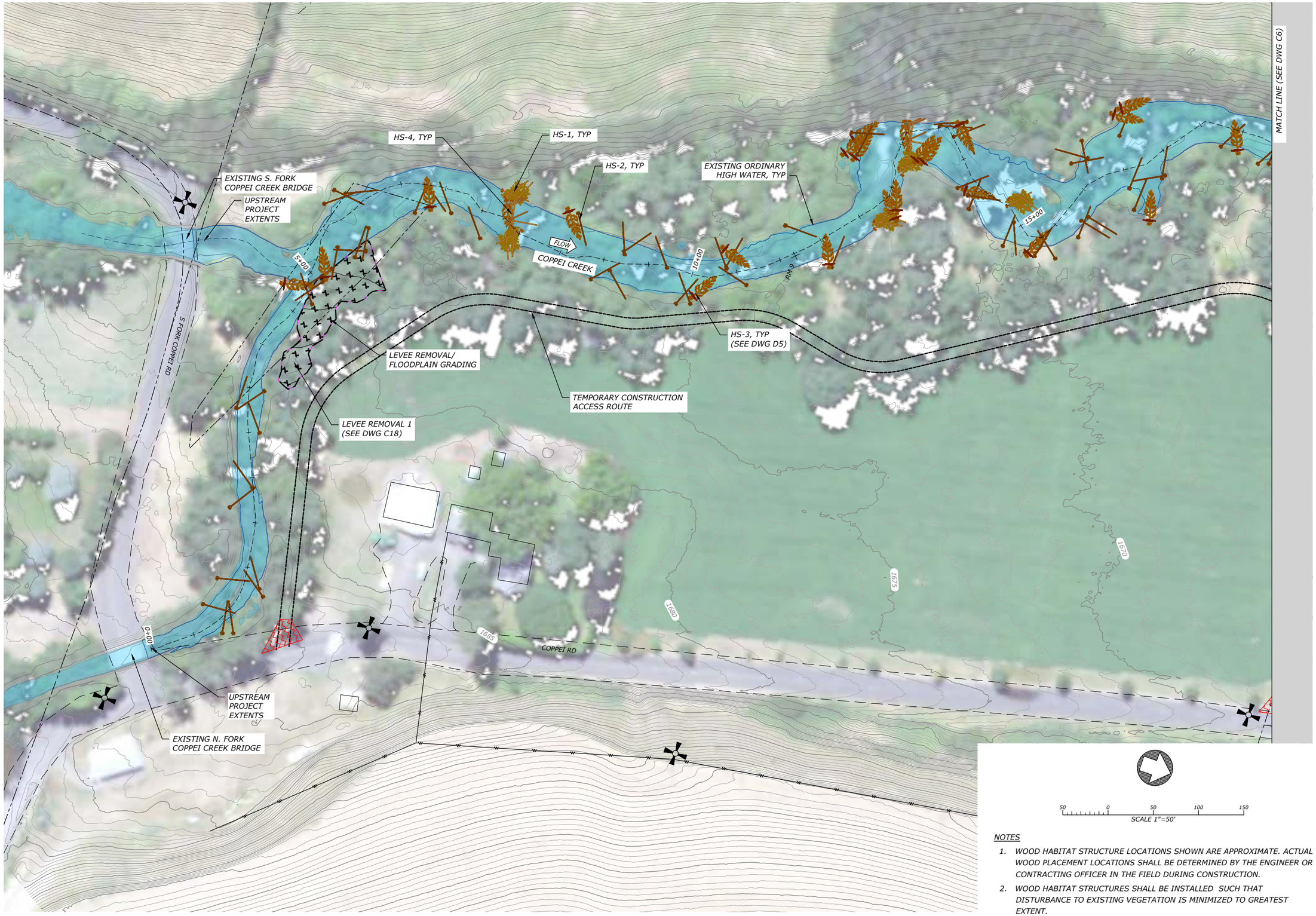

PLAN - 1

50 0 50 100 150
SCALE 1"=50'

NOTES

1. WOOD HABITAT STRUCTURE LOCATIONS SHOWN ARE APPROXIMATE. ACTUAL WOOD PLACEMENT LOCATIONS SHALL BE DETERMINED BY THE ENGINEER OR CONTRACTING OFFICER IN THE FIELD DURING CONSTRUCTION.
2. WOOD HABITAT STRUCTURES SHALL BE INSTALLED SUCH THAT DISTURBANCE TO EXISTING VEGETATION IS MINIMIZED TO GREATEST EXTENT.

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PLAN - 1

DRAWING NO.
C5
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50 0 50 100 150
SCALE 1"=50'

NOTES

1. WOOD HABITAT STRUCTURE LOCATIONS SHOWN ARE APPROXIMATE. ACTUAL WOOD PLACEMENT LOCATIONS SHALL BE DETERMINED BY THE ENGINEER OR CONTRACTING OFFICER IN THE FIELD DURING CONSTRUCTION.
2. WOOD HABITAT STRUCTURES SHALL BE INSTALLED SUCH THAT DISTURBANCE TO EXISTING VEGETATION IS MINIMIZED TO GREATEST EXTENT.

PLAN - 2

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DRAWING NAME
PROPOSED CONDITIONS
PLAN - 2

DRAWING NO.
C6
SHEET 11 OF 33

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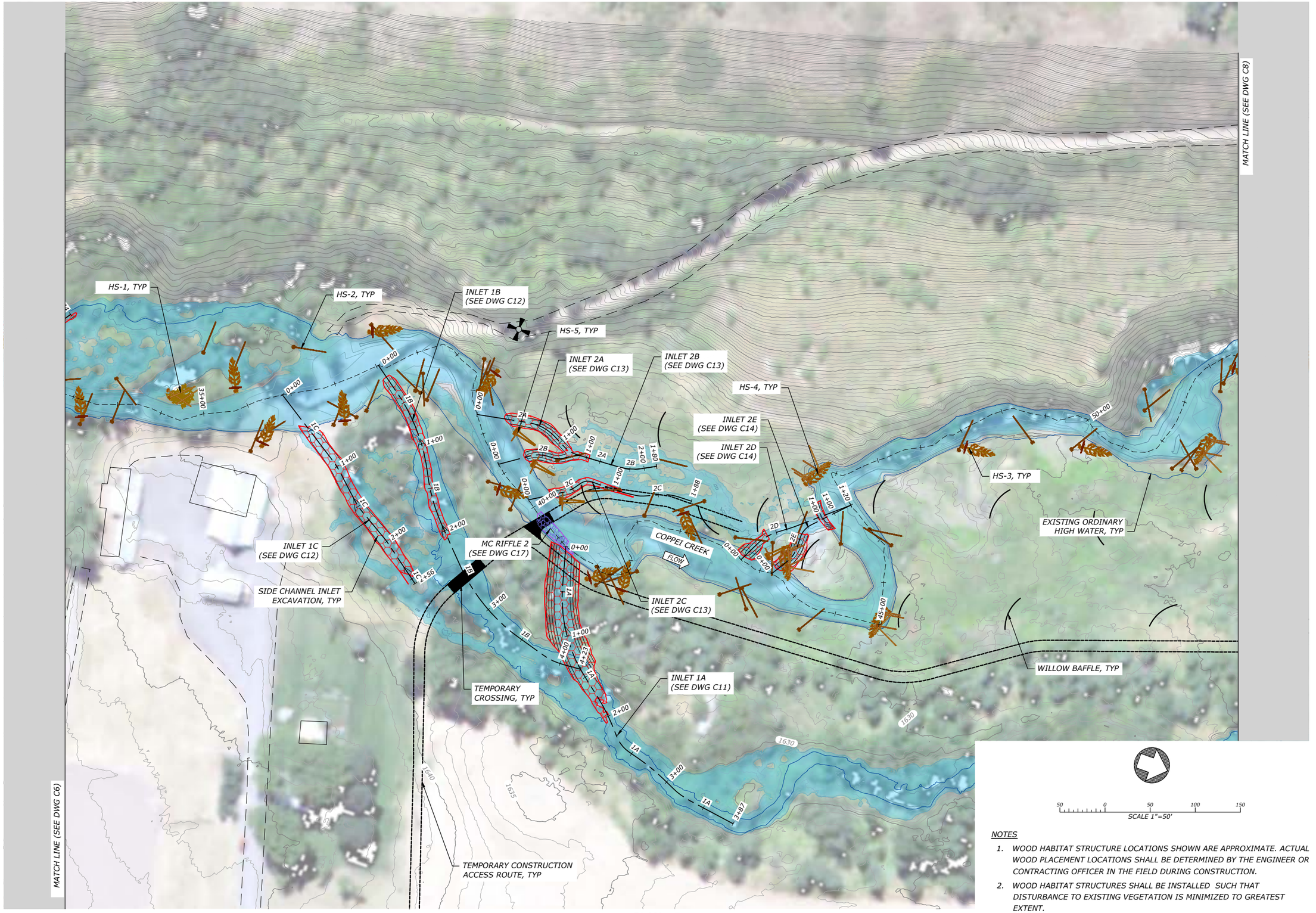

PLAN - 3

NOTES

1. WOOD HABITAT STRUCTURE LOCATIONS SHOWN ARE APPROXIMATE. ACTUAL WOOD PLACEMENT LOCATIONS SHALL BE DETERMINED BY THE ENGINEER OR CONTRACTING OFFICER IN THE FIELD DURING CONSTRUCTION.
2. WOOD HABITAT STRUCTURES SHALL BE INSTALLED SUCH THAT DISTURBANCE TO EXISTING VEGETATION IS MINIMIZED TO GREATEST EXTENT.

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DRAWING NAME
PROPOSED CONDITIONS
PLAN - 3

DRAWING NO.
C7
SHEET 12 OF 33

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PLAN - 4

NOTES

1. WOOD HABITAT STRUCTURE LOCATIONS SHOWN ARE APPROXIMATE. ACTUAL WOOD PLACEMENT LOCATIONS SHALL BE DETERMINED BY THE ENGINEER OR CONTRACTING OFFICER IN THE FIELD DURING CONSTRUCTION.
2. WOOD HABITAT STRUCTURES SHALL BE INSTALLED SUCH THAT DISTURBANCE TO EXISTING VEGETATION IS MINIMIZED TO GREATEST EXTENT.

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DRAWING NAME
PROPOSED CONDITIONS

PLAN - 4

DRAWING NO.
C8
SHEET 13 OF 33

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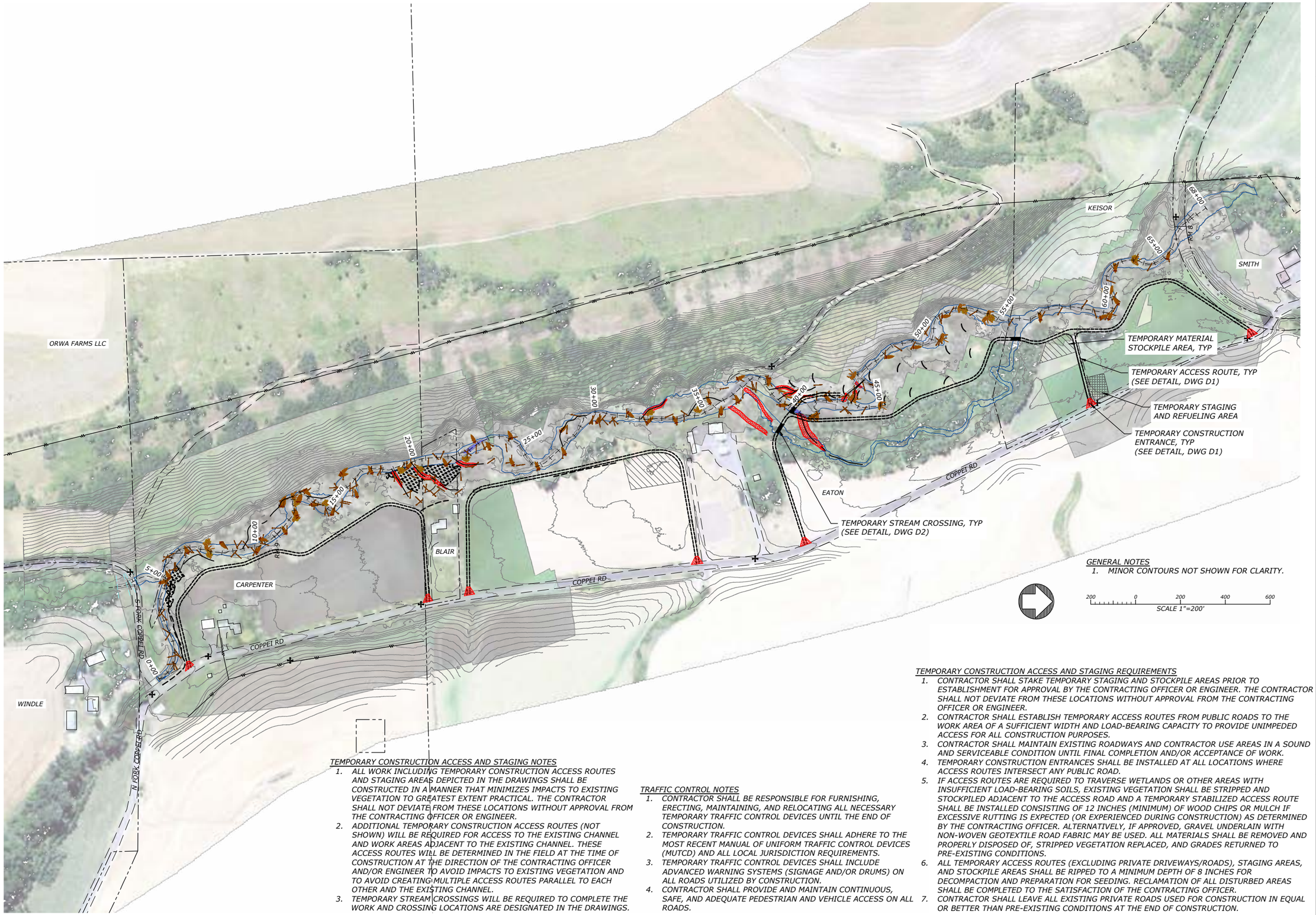

GENERAL NOTES
1. MINOR CONTOURS NOT SHOWN FOR CLARITY.

TEMPORARY CONSTRUCTION ACCESS AND STAGING NOTES
1. ALL WORK INCLUDING TEMPORARY CONSTRUCTION ACCESS ROUTES AND STAGING AREAS DEPICTED IN THE DRAWINGS SHALL BE CONSTRUCTED IN A MANNER THAT MINIMIZES IMPACTS TO EXISTING VEGETATION TO GREATEST EXTENT PRACTICAL. THE CONTRACTOR SHALL NOT DEVIATE FROM THESE LOCATIONS WITHOUT APPROVAL FROM THE CONTRACTING OFFICER OR ENGINEER.
2. ADDITIONAL TEMPORARY CONSTRUCTION ACCESS ROUTES (NOT SHOWN) WILL BE REQUIRED FOR ACCESS TO THE EXISTING CHANNEL AND WORK AREAS ADJACENT TO THE EXISTING CHANNEL. THESE ACCESS ROUTES WILL BE DETERMINED IN THE FIELD AT THE TIME OF CONSTRUCTION AT THE DIRECTION OF THE CONTRACTING OFFICER AND/OR ENGINEER TO AVOID IMPACTS TO EXISTING VEGETATION AND TO AVOID CREATING MULTIPLE ACCESS ROUTES PARALLEL TO EACH OTHER AND THE EXISTING CHANNEL.
3. TEMPORARY STREAM CROSSINGS WILL BE REQUIRED TO COMPLETE THE WORK AND CROSSING LOCATIONS ARE DESIGNATED IN THE DRAWINGS.

TRAFFIC CONTROL NOTES
1. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING, ERECTING, MAINTAINING, AND RELOCATING ALL NECESSARY TEMPORARY TRAFFIC CONTROL DEVICES UNTIL THE END OF CONSTRUCTION.
2. TEMPORARY TRAFFIC CONTROL DEVICES SHALL ADHERE TO THE MOST RECENT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND ALL LOCAL JURISDICTION REQUIREMENTS.
3. TEMPORARY TRAFFIC CONTROL DEVICES SHALL INCLUDE ADVANCED WARNING SYSTEMS (SIGNAGE AND/OR DRUMS) ON ALL ROADS UTILIZED BY CONSTRUCTION.
4. CONTRACTOR SHALL PROVIDE AND MAINTAIN CONTINUOUS, SAFE, AND ADEQUATE PEDESTRIAN AND VEHICLE ACCESS ON ALL ROADS.

TEMPORARY CONSTRUCTION ACCESS AND STAGING REQUIREMENTS
1. CONTRACTOR SHALL STAKE TEMPORARY STAGING AND STOCKPILE AREAS PRIOR TO ESTABLISHMENT FOR APPROVAL BY THE CONTRACTING OFFICER OR ENGINEER. THE CONTRACTOR SHALL NOT DEVIATE FROM THESE LOCATIONS WITHOUT APPROVAL FROM THE CONTRACTING OFFICER OR ENGINEER.
2. CONTRACTOR SHALL ESTABLISH TEMPORARY ACCESS ROUTES FROM PUBLIC ROADS TO THE WORK AREA OF A SUFFICIENT WIDTH AND LOAD-BEARING CAPACITY TO PROVIDE UNIMPEDED ACCESS FOR ALL CONSTRUCTION PURPOSES.
3. CONTRACTOR SHALL MAINTAIN EXISTING ROADWAYS AND CONTRACTOR USE AREAS IN A SOUND AND SERVICEABLE CONDITION UNTIL FINAL COMPLETION AND/OR ACCEPTANCE OF WORK.
4. TEMPORARY CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT ALL LOCATIONS WHERE ACCESS ROUTES INTERSECT ANY PUBLIC ROAD.
5. IF ACCESS ROUTES ARE REQUIRED TO TRAVERSE WETLANDS OR OTHER AREAS WITH INSUFFICIENT LOAD-BEARING SOILS, EXISTING VEGETATION SHALL BE STRIPPED AND STOCKPILED ADJACENT TO THE ACCESS ROAD AND A TEMPORARY STABILIZED ACCESS ROUTE SHALL BE INSTALLED CONSISTING OF 12 INCHES (MINIMUM) OF WOOD CHIPS OR MULCH IF EXCESSIVE RUTTING IS EXPECTED (OR EXPERIENCED DURING CONSTRUCTION) AS DETERMINED BY THE CONTRACTING OFFICER. ALTERNATIVELY, IF APPROVED, GRAVEL UNDERLAIN WITH NON-WOVEN GEOTEXTILE ROAD FABRIC MAY BE USED. ALL MATERIALS SHALL BE REMOVED AND PROPERLY DISPOSED OF, STRIPPED VEGETATION REPLACED, AND GRADES RETURNED TO PRE-EXISTING CONDITIONS.
6. ALL TEMPORARY ACCESS ROUTES (EXCLUDING PRIVATE DRIVEWAYS/ROADS), STAGING AREAS, AND STOCKPILE AREAS SHALL BE RIPPED TO A MINIMUM DEPTH OF 8 INCHES FOR DECOMPACTION AND PREPARATION FOR SEEDING. RECLAMATION OF ALL DISTURBED AREAS SHALL BE COMPLETED TO THE SATISFACTION OF THE CONTRACTING OFFICER.
7. CONTRACTOR SHALL LEAVE ALL EXISTING PRIVATE ROADS USED FOR CONSTRUCTION IN EQUAL OR BETTER THAN PRE-EXISTING CONDITIONS AT THE END OF CONSTRUCTION.

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COPPEI CREEK PROJECT AREA 07
30% DESIGN DRAWINGS

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COPPEI CREEK
WALLA WALLA COUNTY, WASHINGTON
NWS-2023-201 46.1902, -118.1108

WORKING DRAFT FOR REVIEW AND REVISION

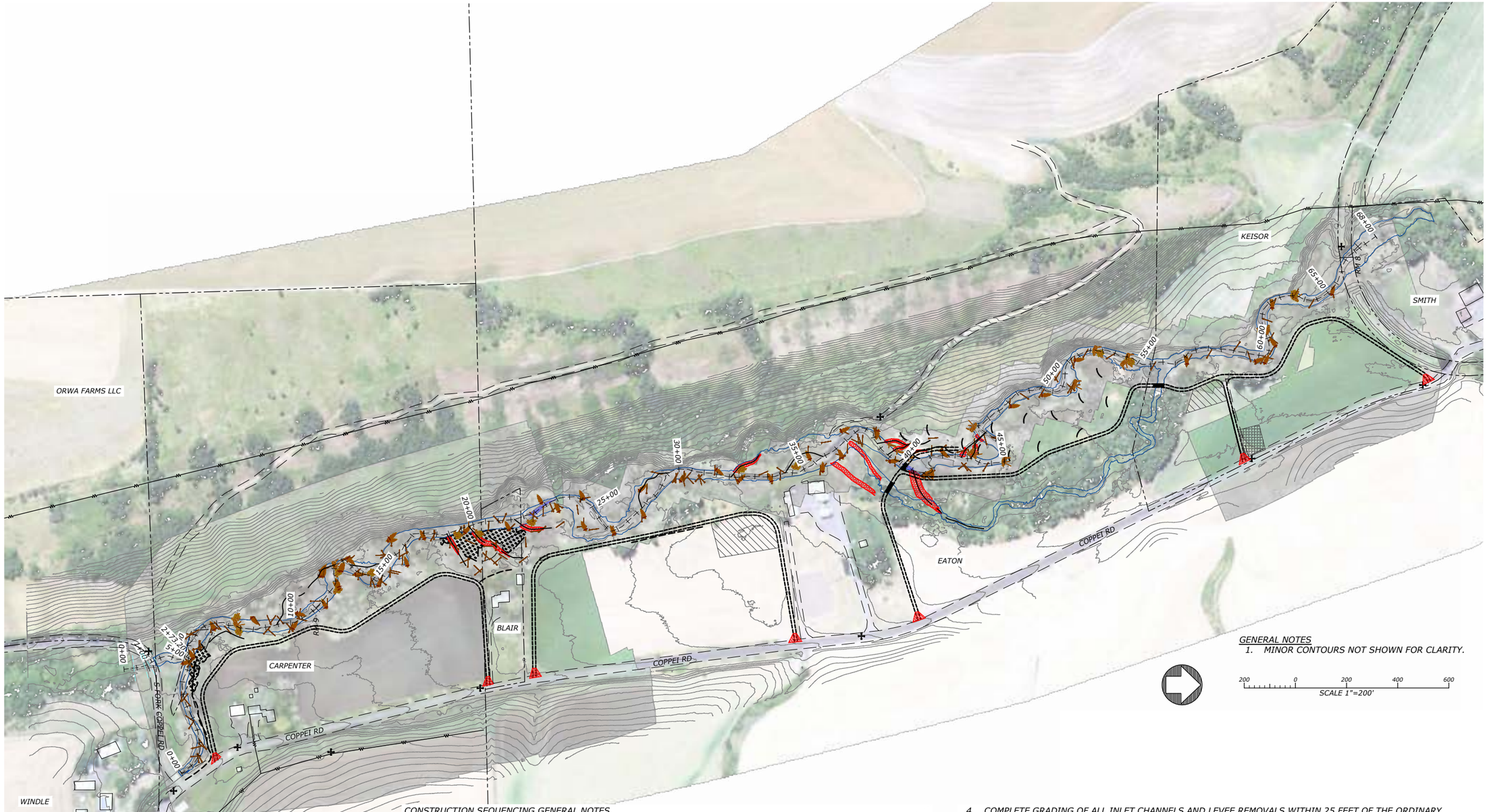
DATE: MARCH 1, 2023
DESIGNED: E. MILLER, S. BOX
APPROVED: J. FEALKO

DRAWING NAME
PROPOSED CONDITIONS

ACCESS & STAGING

DRAWING NO.
C9
SHEET 14 OF 33

FILE: R:\PROJECTS\WALLA WALLA HUC5\COPPEI_CR_WWCD\CAD\PRODUCTION\COPPEI_CREEK_PROPOSED_ACCESS_SEQUENCING.DWG SAVED BY: TSICK PLOT DATE: 3/7/2023 2:29 PM



CONSTRUCTION SEQUENCING GENERAL NOTES

1. THE CONTRACTOR SHALL REVIEW THIS PLAN CLOSELY AND SUBMIT A REVISED PLAN TO BE REVIEWED BY THE CONTRACTING OFFICER OR ENGINEER PRIOR TO BEGINNING WORK. THE CONSTRUCTION SEQUENCING PLAN SUBMITTAL SHALL BE INCLUDE DETAILS REGARDING ALL MEANS, METHODS, AND EQUIPMENT USED TO COMPLETE THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, HEALTH AND SAFETY PLAN, ALL APPLICABLE OSHA REGULATORY REQUIREMENTS.
2. WORK IS EXPECTED TO OCCUR BEFORE, DURING, AND AFTER THE APPROVED IN-WATER WORK WINDOW.
3. PRIOR TO BEGINNING WORK, CONTRACTOR SHALL INSTALL ALL TEMPORARY STORMWATER AND EROSION CONTROLS/BMPS IN ACCORDANCE WITH AN APPROVED SWPPP WHICH IS TO BE DEVELOPED AND IMPLEMENTED BY THE CONTRACTOR. ALSO, THE CONTRACTOR SHALL INSTALL CONSTRUCTION ENTRANCES/EXITS IN ACCORDANCE WITH THE DRAWINGS PRIOR TO PERFORMING CLEARING AND/OR ACCESS ROUTE IMPROVEMENTS/INSTALLATIONS.
4. ALL EXCESS SPOILS GENERATED BY PROJECT EXCAVATIONS SHALL BE HAULED TO A CONTRACTOR PROVIDED OFFSITE LOCATION APPROVED BY THE CONTRACTING OFFICER.

STAGE 1 (PRIOR TO THE IN-WATER WORK WINDOW)

1. FULLY MOBILIZE EQUIPMENT AND STOCKPILE NECESSARY MATERIALS TO BEGIN CONSTRUCTION.
2. VERIFY ACCURACY OF CONTROL POINTS AND PERFORM STAKING OF WORK ELEMENTS. IF MACHINE CONTROL IS USED, PERFORM LOCALIZATION AND VERIFICATION OF SURVEY CONTROL.
3. WORK WITH CONTRACTING OFFICER OR ENGINEER TO DELINEATE AND INSTALL TEMPORARY CONSTRUCTION ACCESS ROUTES FROM PRIMARY ROUTES SHOWN IN THE DRAWINGS TO WORK AREAS WITHIN AND ADJACENT TO THE CHANNEL.
4. COMPLETE GRADING OF ALL INLET CHANNELS AND LEVEE REMOVALS WITHIN 25 FEET OF THE ORDINARY HIGH-WATER LIMITS.
5. INSTALL FLOODPLAIN ROUGHNESS STRUCTURES (WILLOW BAFFLES) IN AREAS THAT ARE ACCESSIBLE AND THAT WILL NOT BE IMPACTED BY CONSTRUCTION OF OTHER WORK ITEMS TO BE COMPLETED IN THE NEXT STAGE.

STAGE 2 (DURING THE IN-WATER WORK WINDOW)

1. PLACE TEMPORARY COFFERDAMS AND TEMPORARY STREAM CROSSINGS WITHIN THE ACTIVE CHANNEL AS NECESSARY TO COMPLETE GRADING OF ALL INLET CHANNELS, LEVEE REMOVALS, WOOD HABITAT STRUCTURES, AND CONSTRUCTED RIFFLES.
2. COMPLETE ALL EARTHWORK ACTIVITIES AND OBTAIN FINAL APPROVAL OF ALL WORK WITHIN THE ORDINARY HIGH-WATER EXTENTS PRIOR TO THE END OF THE APPROVED IN-WATER WORK WINDOW.

STAGE 3 (AFTER THE IN-WATER WORK WINDOW)

1. COMPLETE ALL EARTHWORK ACTIVITIES LOCATED OUTSIDE OF THE ORDINARY HIGH-WATER EXTENTS.
2. COMPLETE SOIL DECOMPACTION ON ALL CONTRACTOR USE AREAS (TEMPORARY CONSTRUCTION ACCESS ROUTES, STAGING AREAS, AND STOCKPILE AREAS).
3. COMPLETE PLANTING AND SEEDING OF ALL DISTURBED AREAS AND ANY OTHER AREAS DESIGNATED IN THE DRAWINGS.
4. COMPLETE FINAL PUNCHLIST ITEMS, SEEK APPROVAL OF WORK ALL WORK ITEMS, CLEANUP SITE, AND DEMOBILIZE ALL EQUIPMENT.

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30% DESIGN DRAWINGS

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NWS-2023-201 46.1902, -118.1108

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DATE: MARCH 1, 2023
DESIGNED: E. MILLER, S. BOX
APPROVED: J. FEALKO

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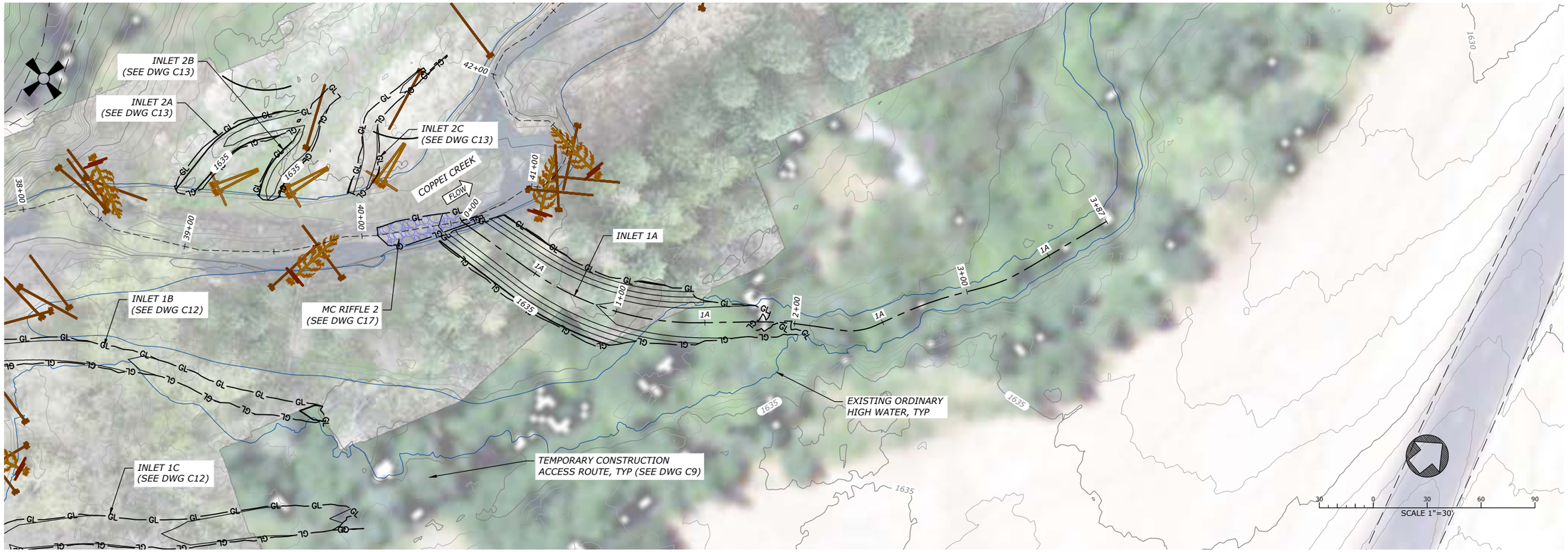
PROPOSED CONDITIONS

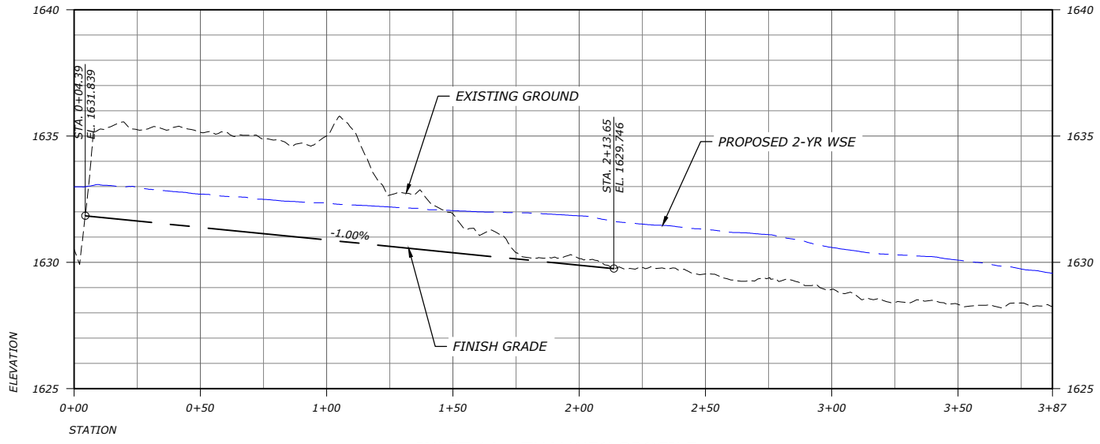
SEQUENCING

DRAWING NO.
C10
SHEET 15 OF 33

FILE: R:\PROJECTS\WALLA WALLA HUC5\COPPEI CR\WWCD\CAD\PRODUCTION\COPPEI CREEK PROPOSED ACCESS SEQUENCING.DWG SAVED BY: TSICK PLOT DATE: 3/7/2023 2:29 PM



INLET 1A - PLAN
STA 0+00 TO 3+87



INLET 1A - THALWEG PROFILE
STA 0+00 TO 3+87

HORIZONTAL SCALE
SCALE 1"=30'

VERTICAL SCALE
SCALE 1"=3'

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COPPEI CREEK PROJECT AREA 07
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PLAN & PROFILE

INLET 1A

DRAWING NO.
C11
SHEET 16 OF 33

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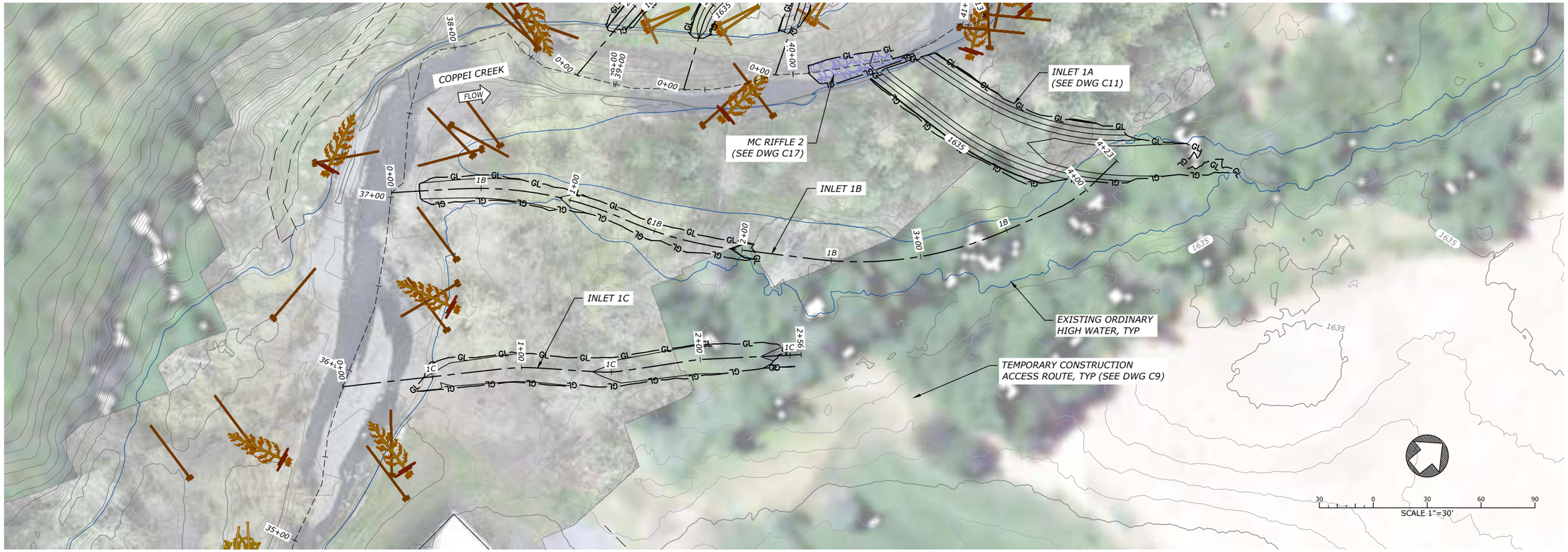

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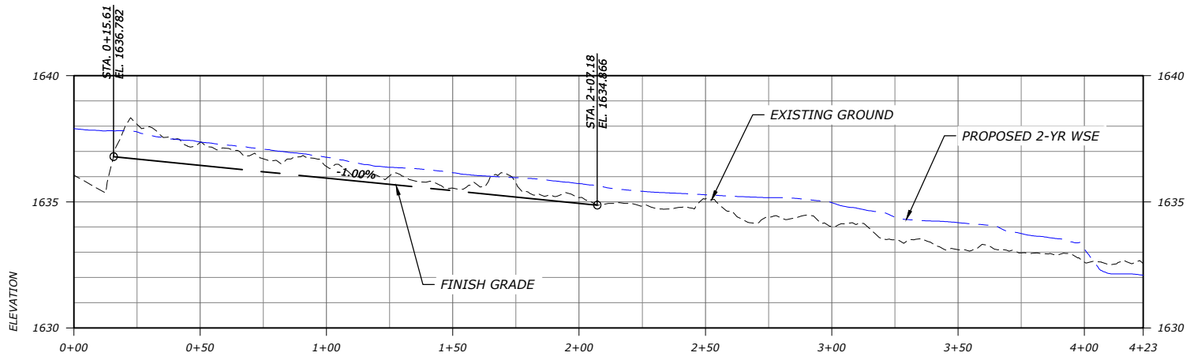

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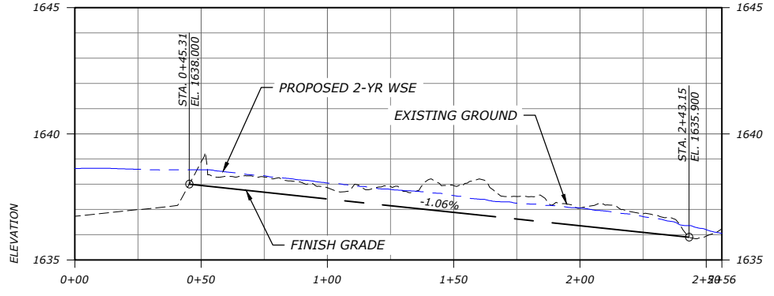

INLET 1C - THALWEG PROFILE
STA 0+00 TO 2+56

HORIZONTAL SCALE
SCALE 1"=30'

VERTICAL SCALE
SCALE 1"=3'

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INLET 1B, 1C

DRAWING NO.
C12
SHEET 17 OF 33

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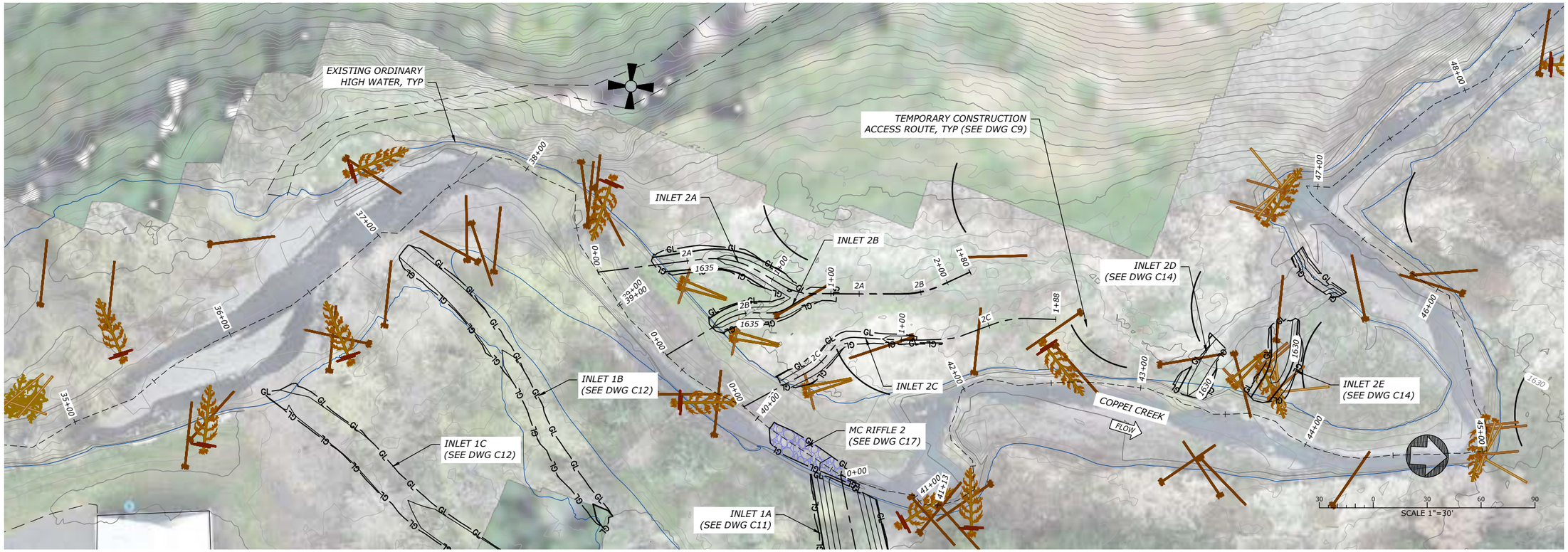

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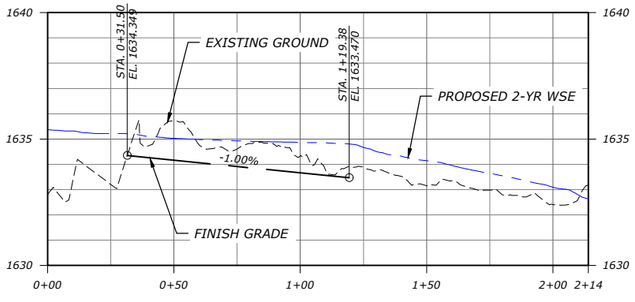

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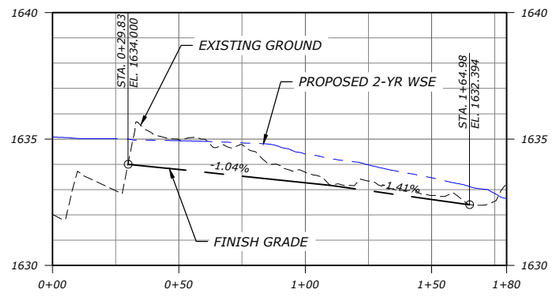
STA 0+00 TO 2+14



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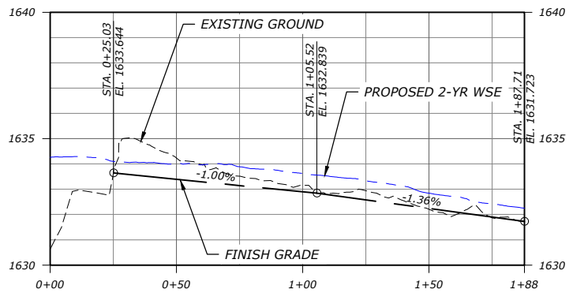
STA 0+00 TO 1+80



INLET 2C - THALWEG PROFILE

STA 0+00 TO 1+88

HORIZONTAL SCALE
SCALE 1"=30'

VERTICAL SCALE
SCALE 1"=3'

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PLAN & PROFILE
INLET 2A, 2B, 2C

DRAWING NO.
C13
SHEET 18 OF 33

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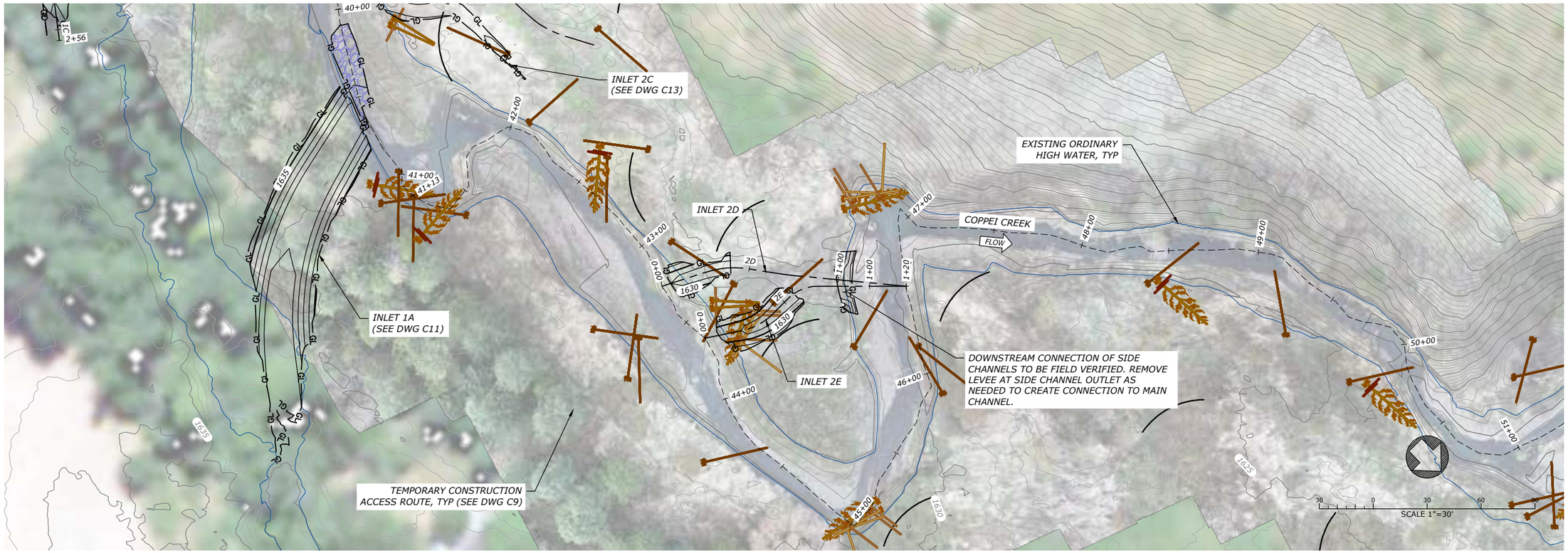

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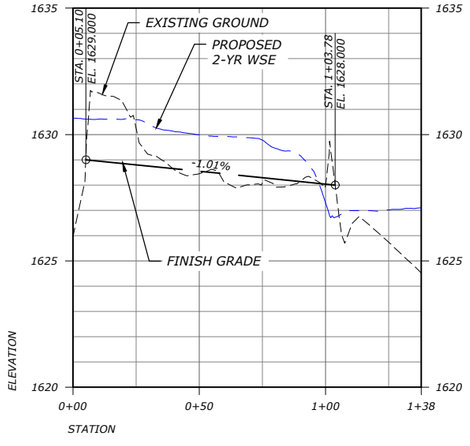
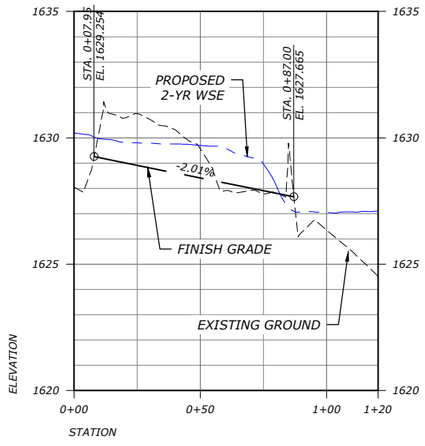


INLET 2D - THALWEG PROFILE
STA 0+00 TO 1+38



INLET 2E - THALWEG PROFILE
STA 0+00 TO 1+20

HORIZONTAL SCALE
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SCALE 1"=30'

VERTICAL SCALE
3 0 3 6 9
SCALE 1"=3'

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PLAN & PROFILE
INLET 2D, 2E

DRAWING NO.
C14
SHEET 19 OF 33

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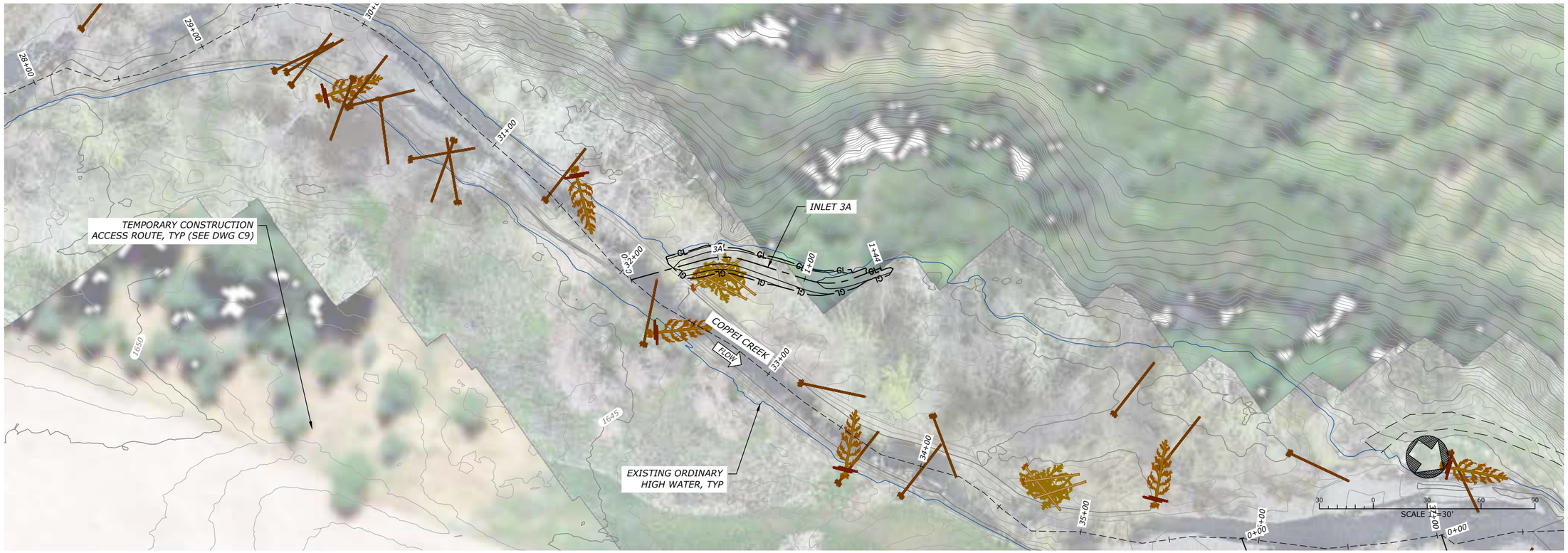
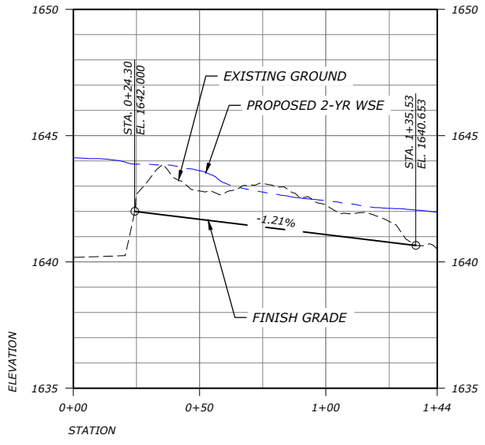


INLET 3A - PLAN
STA 0+00 TO 1+39



INLET 3A - THALWEG PROFILE
STA 0+00 TO 1+39

HORIZONTAL SCALE
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SCALE 1"=30'

VERTICAL SCALE
3 0 3 6 9
SCALE 1"=3'

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INLET 3A

DRAWING NO.
C15
SHEET 20 OF 33

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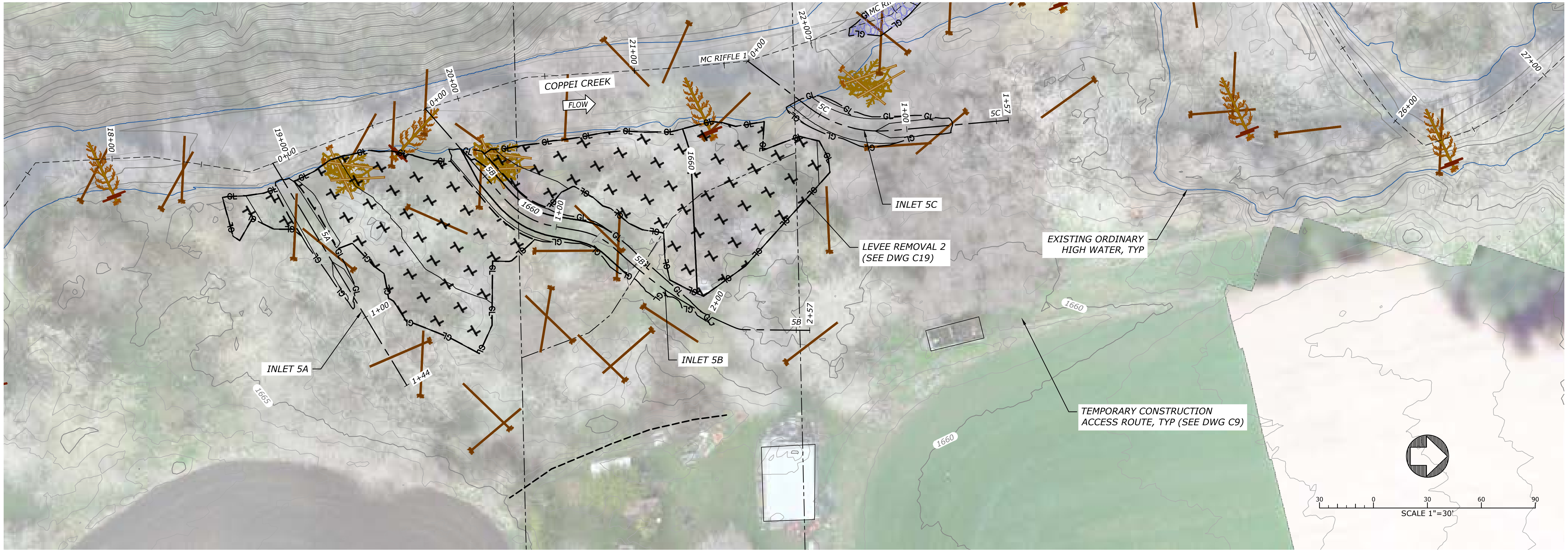

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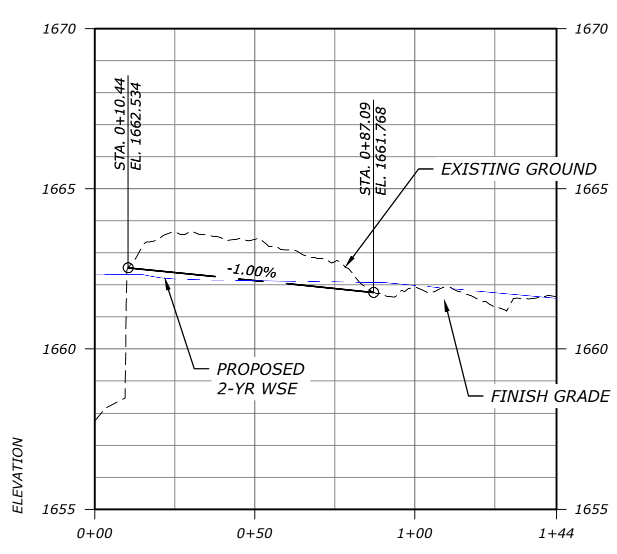
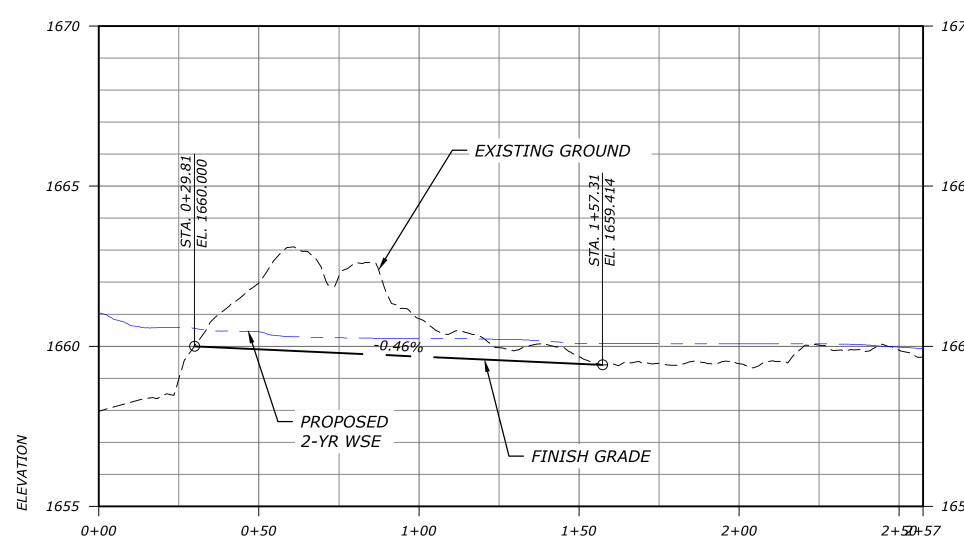


INLET 5A - THALWEG PROFILE

STA 0+00 TO 3+29



INLET 5B - THALWEG PROFILE

STA 0+00 TO 5+66

HORIZONTAL SCALE

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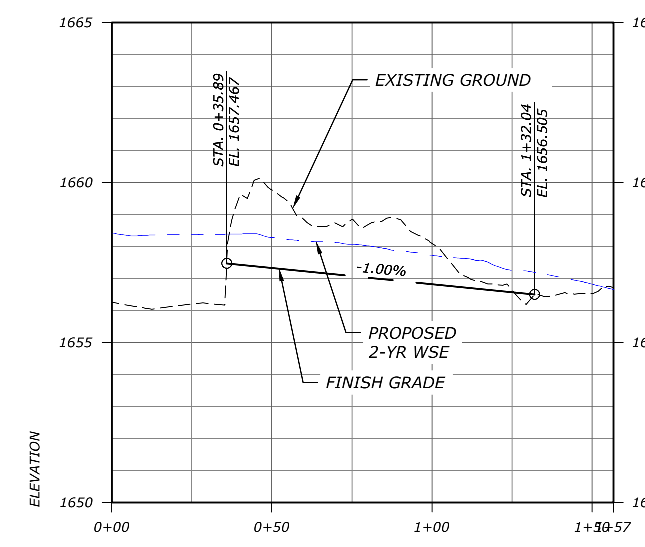
SCALE 1"=30'

VERTICAL SCALE

3 0 3 6 9

SCALE 1"=3'



INLET 5C - THALWEG PROFILE

STA 0+00 TO 1+57

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PLAN & PROFILE

INLET 5A, 5B, 5C

DRAWING NO.

C16

SHEET 21 OF 33

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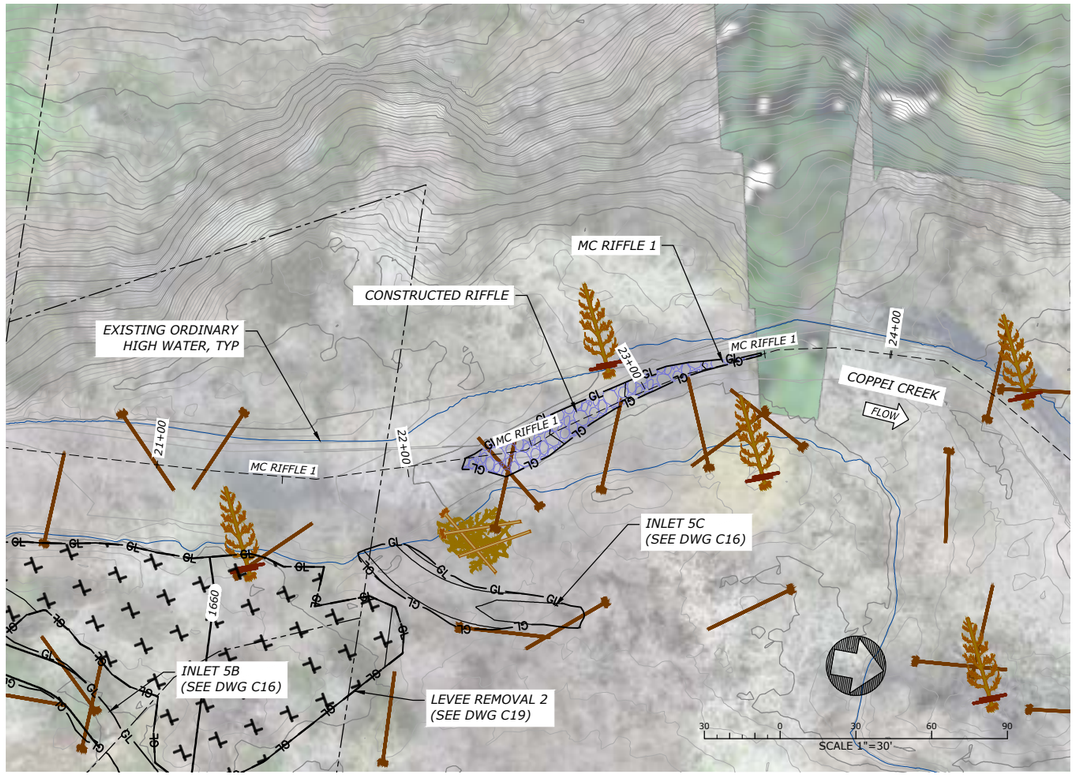
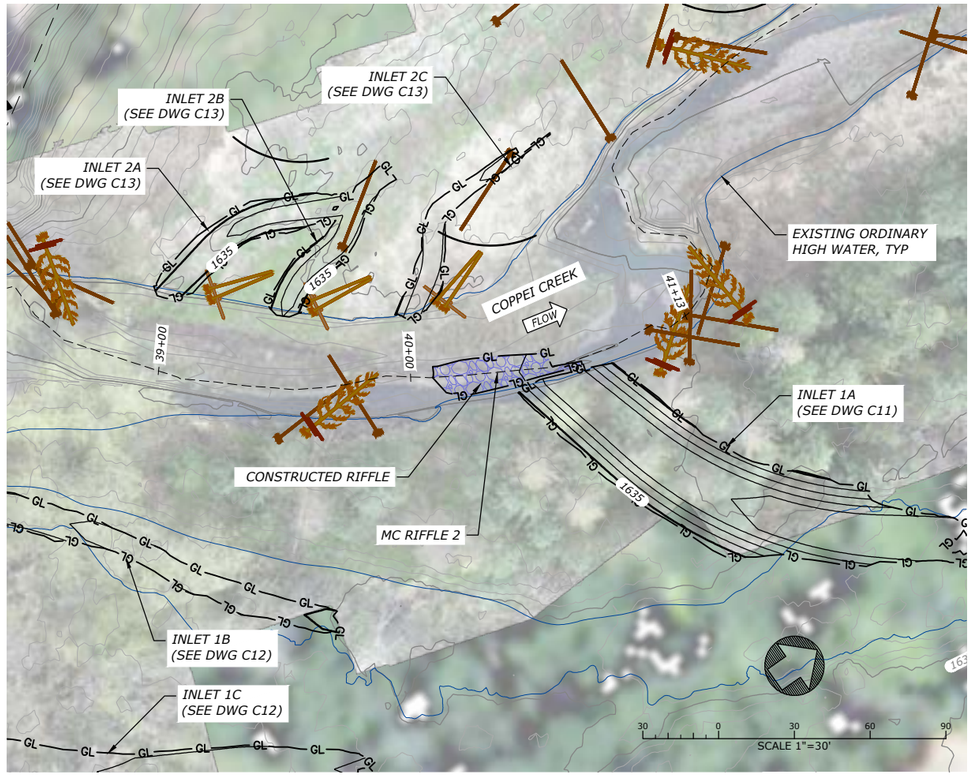
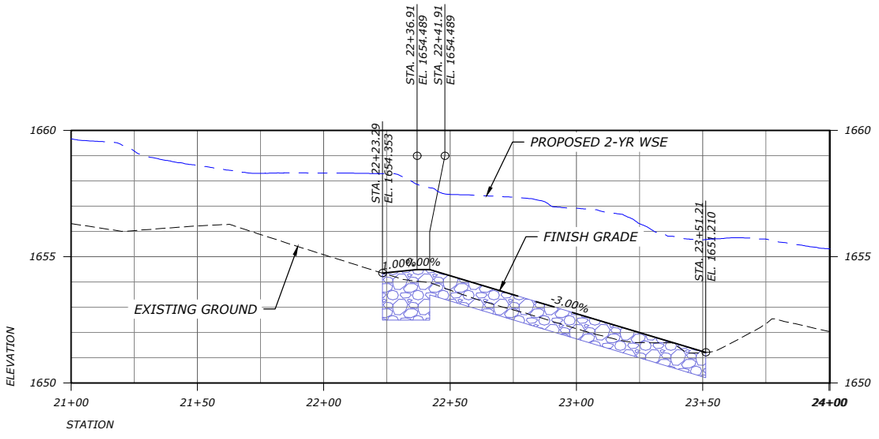
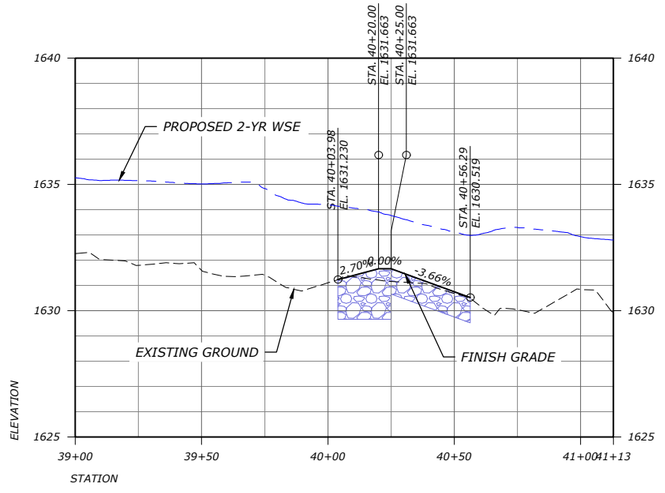






MC RIFFLE 1 - THALWEG PROFILE

STA 21+00 TO 24+00



MC RIFFLE 2 - THALWEG PROFILE

STA 39+00 TO 41+13

HORIZONTAL SCALE

30 0 30 60 90

SCALE 1"=30'

VERTICAL SCALE

3 0 3 6 9

SCALE 1"=3'

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APPROVED: J. FEALKO

DRAWING NAME

PLAN & PROFILE

MC RIFFLE 1 & 2

DRAWING NO.

C17

SHEET 22 OF 33

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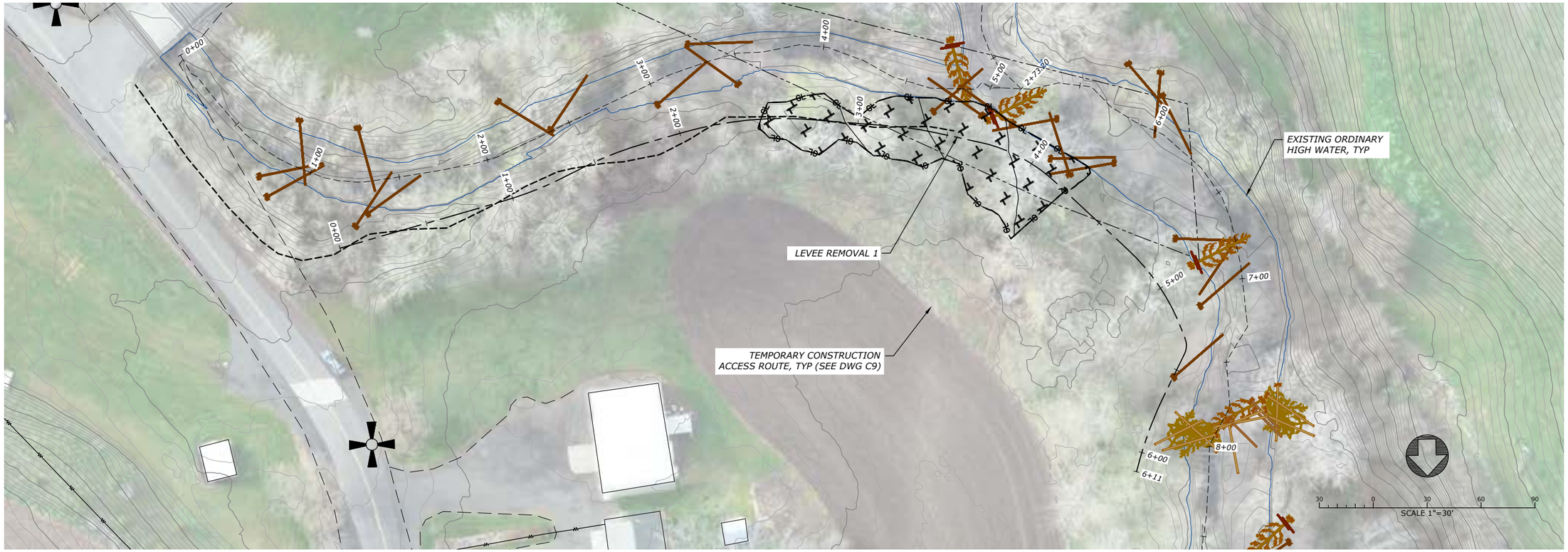
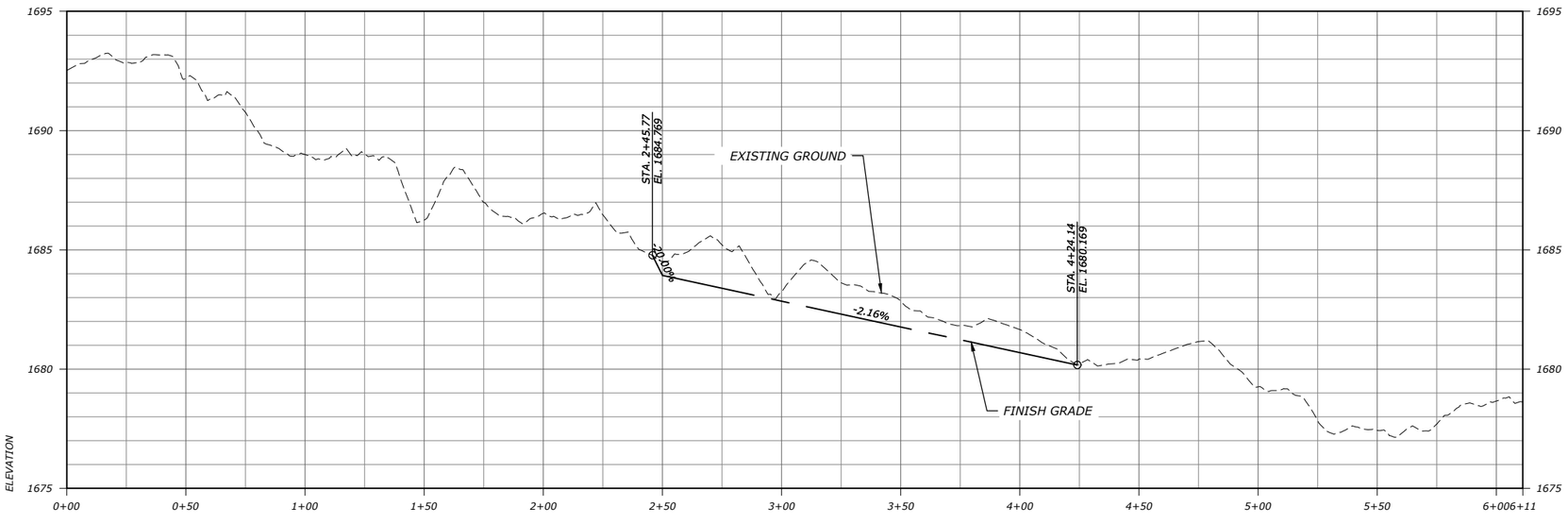


LEVEE REMOVAL 1 - PLAN
STA 0+00 TO 6+11



LEVEE REMOVAL 1 - PROFILE
STA 0+00 TO 6+11

HORIZONTAL SCALE
30 0 30 60 90
SCALE 1"=30'

VERTICAL SCALE
3 0 3 6 9
SCALE 1"=3'

NOTES

1. *PROTECT EXISTING VEGETATION TO GREATEST EXTENT POSSIBLE WHEN EXCAVATING EXISTING LEVEE.*
2. *LEVEE REMOVAL EXTENTS AND ELEVATIONS SHOWN ARE APPROXIMATE, ACTUAL EXTENTS AND FINISH GRADE TO BE FIELD FIT AND VERIFIED BY ENGINEER OR CONTRACTING OFFICER.*

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COPPEI CREEK PROJECT AREA 07
30% DESIGN DRAWINGS

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COPPEI CREEK
WALLA WALLA COUNTY, WASHINGTON
NWS-2023-201 46.1902, -118.1108

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DATE: MARCH 1, 2023
DESIGNED: E. MILLER, S. BOX
APPROVED: J. FEALKO

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PLAN & PROFILE

LEVEE REMOVAL 1

DRAWING NO.
C18
SHEET 23 OF 33

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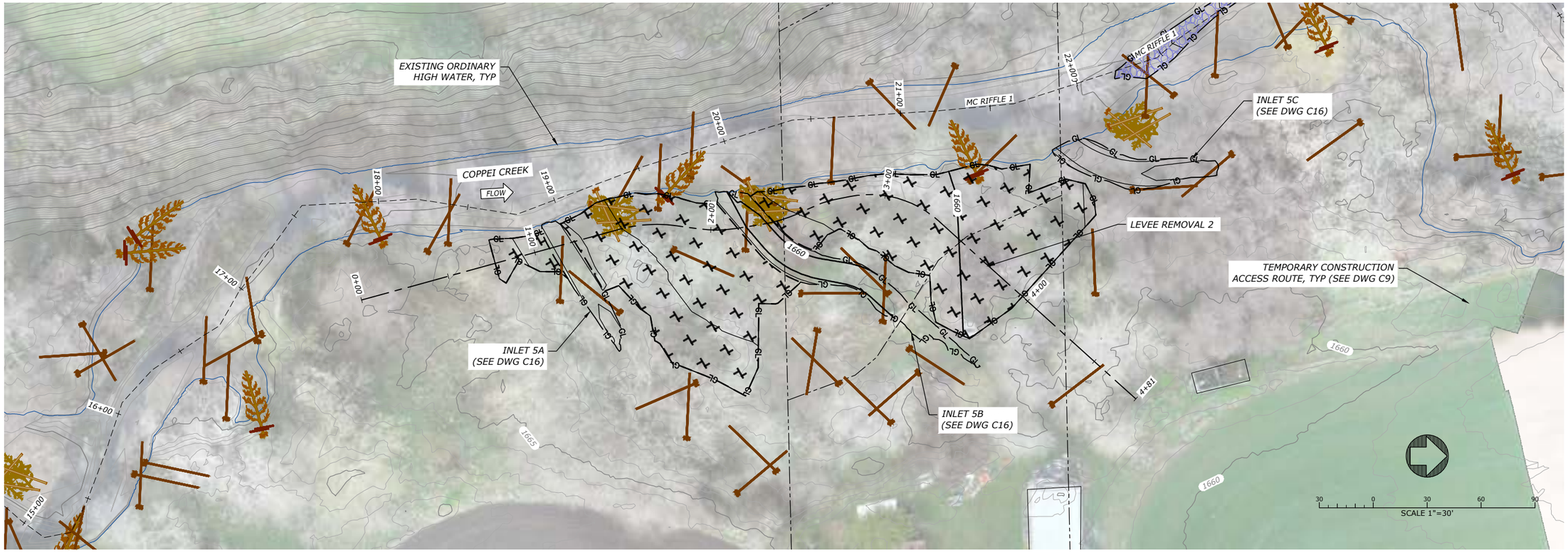
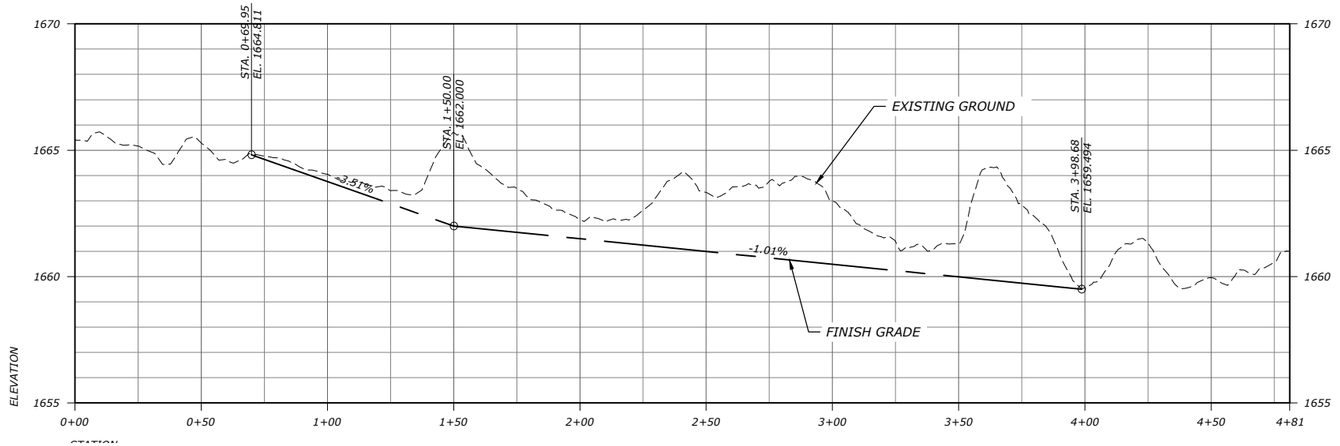


LEVEE REMOVAL 2 - PLAN
STA 0+00 TO 4+81



LEVEE REMOVAL 2 - PROFILE
STA 0+00 TO 4+81

HORIZONTAL SCALE
SCALE 1"=30'

VERTICAL SCALE
SCALE 1"=3'

NOTES

1. *PROTECT EXISTING VEGETATION TO GREATEST EXTENT POSSIBLE WHEN EXCAVATING EXISTING LEVEE.*
2. *LEVEE REMOVAL EXTENTS AND ELEVATIONS SHOWN ARE APPROXIMATE, ACTUAL EXTENTS AND FINISH GRADE TO BE FIELD FIT AND VERIFIED BY ENGINEER OR CONTRACTING OFFICER.*

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LEVEE REMOVAL 2

DRAWING NO.
C19
SHEET 24 OF 33

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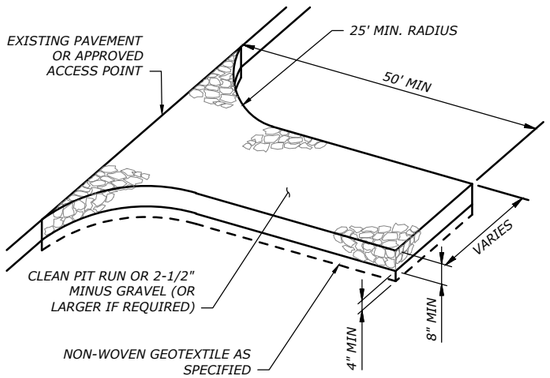
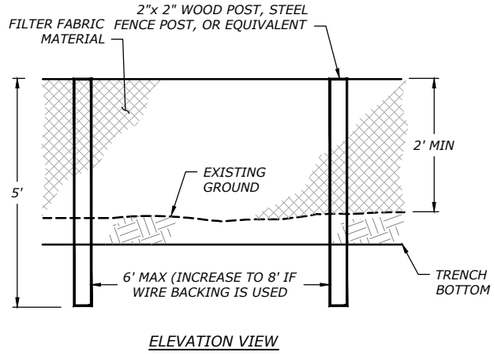
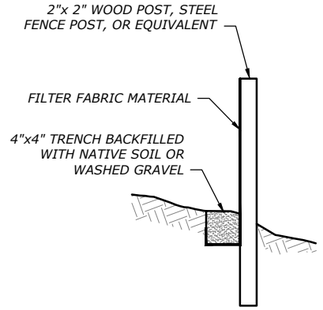


NOTES:
1. ADDITIONAL GRAVEL SHALL BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
2. REMOVE GRAVEL ENTRANCE AND REPLACE WITH BASE COURSE PRIOR TO COMPLETION OF THE PROJECT.

1 TEMPORARY CONSTRUCTION ENTRANCE
NTS



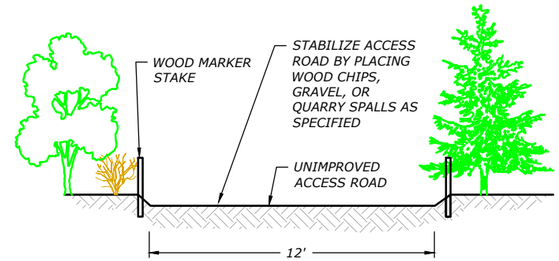
ELEVATION VIEW



SECTION VIEW

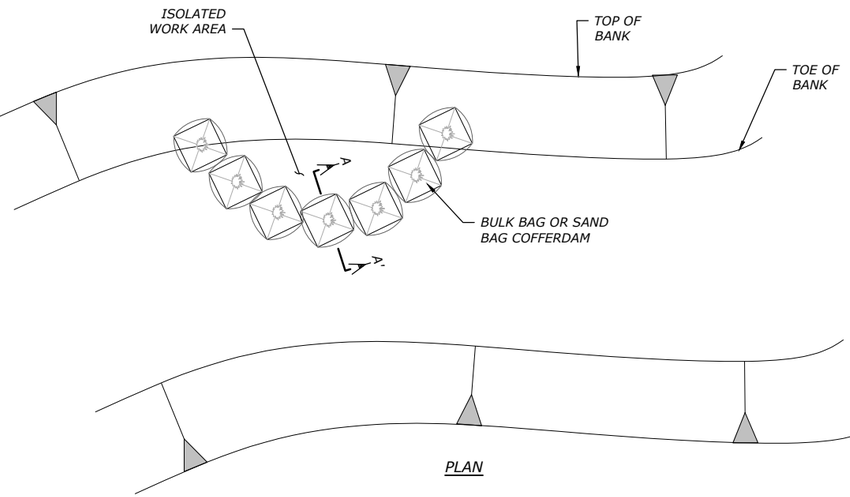
NOTES:
1. JOINTS IN FILTER FABRIC SHALL BE SPLICED AT POSTS. USE STABLES, WIRE RINGS, OR EQUIVALENT TO ATTACH FABRIC TO POSTS WITH A MINIMUM 4" OVERLAP.
2. STITCHED LOOPS ON FILTER FABRIC (IF PRESENT) TO BE INSTALLED ON DOWNHILL SIDE OF SLOPE.
3. GROUND MAY BE ROCKY; PLAN ACCORDINGLY FOR PROPER EQUIPMENT SELECTION.

2 SILT FENCE
NTS



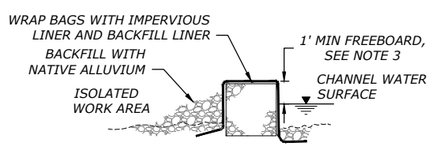
NOTES:
1. CLEARED ACCESS TO BE ROUTED TO MINIMIZE VEGETATION DISTURBANCE AND FOREST CLEARING.
2. CONTRACTOR SHALL MARK CLEARING LIMITS. CLEARING LIMITS TO BE APPROVED BY ENGINEER PRIOR TO ANY CLEARING ACTIVITIES.
3. ANY TREES GREATER THAN 18" Ø SHALL BE REMOVED W/ ROOTWADS INTACT AND STOCKPILED FOR USE IN LOGJAM CONSTRUCTION.
4. TREES AND SHRUBS WITH 6"-18" Ø SHALL BE STOCKPILED FOR USE AS RACKING MATERIAL IN LOGJAM CONSTRUCTION.
5. VEGETATION AND ORGANIC SOIL SHALL BE STRIPPED, TEMPORARILY STOCKPILED, AND REPLACED ON ROAD ALIGNMENT AFTER WORK IS COMPLETE AND ACCEPTED.
6. ACCESS SHALL BE MAINTAINED BY MINOR GRADING AND PLACEMENT OF WOOD CHIPS, GRAVEL AND/OR QUARRY SPALLS. ALL GRAVEL OR QUARRY SPALLS (IF PLACED) SHALL BE UNDERLAIN WITH A GEOTEXTILE AND REMOVED.
7. RESTORE ACCESS ROADS AND SEED IN ACCORDANCE WITH SEEDING SPECIFICATIONS.

3 ACCESS ROAD
NTS



PLAN

NOTES:
1. ISOLATE INDIVIDUAL HABITAT STRUCTURES WITHIN THE EXISTING CHANNEL USING COFFERDAMS.
2. COFFERDAMS MAY UTILIZE BULK BAGS OR SAND BAGS.
3. WRAP COFFERDAM WITH IMPERVIOUS PLASTIC LINER TO PREVENT SEEPAGE.
4. BACKFILL THE DOWNSTREAM SIDE OF THE COFFERDAM WITH NATIVE ADJACENT ALLUVIUM.
5. USE BULK BAGS OR SANDBAGS AS A BUTTRESS AS REQUIRED.
6. PLACE BAGS CAREFULLY TO PREVENT TEARING OR CUTTING OF BAGS.
7. BAG FILL MATERIAL SHALL BE CLEAN, WASHED, ALLUVIUM.



SECTION VIEW (SINGLE BULK BAG)

4 COFFERDAM
NTS

GENERAL EROSION AND SEDIMENT CONTROL AND WORK AREA ISOLATION NOTES:
1. THE DETAILS SHOWN ON THIS SHEET ARE EXAMPLES OF ACCEPTABLE METHODS TO USE DURING CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND SUBMITTING A COFFERDAM, PUMPING, AND DEWATERING PLAN FOR REVIEW AND APPROVAL BY THE CONTRACTING AGENCY OR ENGINEER. THE PLAN SHALL INCLUDE SUFFICIENT DETAIL OF MEANS AND METHODS SATISFYINGLY MEETING THE PROJECT SPECIFICATIONS AND PERMIT REQUIREMENTS. IF APPROVED, OTHER METHODS MAY BE USED SUCH AS UTILIZING INFLATABLE BLADDERS, PLATES, OR BARRIERS OF VARIOUS MATERIALS. COFFERDAMS SHALL INCLUDE PLASTIC LINER OR FINE MESH SILT FENCE TO REDUCE TURBIDITY AND FINES FROM ENTERING THE FREE FLOWING PORTION OF LIVE WATER.
2. COFFERDAMS SHALL BE CONSTRUCTED TO ACCOMMODATE ALL FLOW CONDITIONS AND WATER SURFACE ELEVATIONS EXPECTED DURING CONSTRUCTION PLUS A MINIMUM OF 1-FOOT OF FREEBOARD. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH WATER QUALITY STANDARDS, SAFETY AND CONSTRUCTION STANDARDS, DAMAGE OR LOSS TO EQUIPMENT, MATERIALS, AND DAMAGES TO PRIVATE PROPERTY.
3. THE CONTRACTING AGENCY IS RESPONSIBLE FOR MEASURING TURBIDITY HOWEVER THE CONTRACTOR SHALL ADHERE TO THE SPECIAL PROCEDURES REGARDING IN-STREAM WORK, TURBIDITY, AND DEWATERING (DRAWINGS G2 AND G3). ADDITIONALLY, THIS PROJECT SHALL ADHERE TO HIP CONSERVATION MEASURES. CONSERVATION MEASURES ARE SUMMARIZED ON DRAWINGS G4 AND G5 AND SHALL BE STRICTLY ADHERED TO.
4. THE CONTRACTOR SHALL NOTIFY THE OWNER AND CONTRACTING OFFICER AT LEAST 5 DAYS BEFORE EACH COFFERDAM INSTALLATION DATE SO THAT FISH SALVAGE ACTIVITIES CAN BE SCHEDULED. ANTICIPATED COFFERDAM LOCATIONS ARE SHOWN IN THE PLANS.
5. FILL MATERIAL FOR BULK BAGS SHALL BE CLEAN, WASHED, AND ROUNDED MATERIAL MEETING STANDARD SPECIFICATIONS FOR DRAIN ROCK, STREAMBED AGGREGATES, STREAMBED SEDIMENTS, OR STREAMBED COBBLES. MATERIAL USED TO FILL BULK BAGS SHALL BE DISPOSED OF IN ACCORDANCE WITH THE PERMITS.
6. DEWATERING PUMP DISCHARGE FROM WITHIN COFFERDAM WORK AREAS SHALL BE RELEASED ONTO FLOODPLAIN AREAS AWAY FROM WETLANDS AND CONSTRUCTION ACTIVITIES. DISCHARGE SHALL BE COMPLETELY INFILTRATED PRIOR TO REACHING WETLANDS OR SURFACE WATERS UNLESS APPROVED BY THE CONTRACTING OFFICER. ALL RETURN FLOWS MUST MEET PERMIT REQUIREMENTS FOR TURBIDITY.
7. EXCAVATIONS ASSOCIATED WITH CHANNEL, FLOODPLAIN, AND WOOD HABITAT STRUCTURES SHALL BE DEWATERED IN ACCORDANCE WITH THE SPECIFICATIONS.
8. ALL PUMP INTAKES SHALL BE SCREENED FOR FISH PROTECTION AS REQUIRED BY NOAA.
9. ALL EARTHWORK ACTIVITIES AND WOOD HABITAT STRUCTURE CONSTRUCTION WITHIN THE ORDINARY HIGH WATER CHANNEL SHALL CONFORM TO THE WATER QUALITY STANDARDS ESTABLISHED BY REGULATORY AGENCY PERMITS FOR THIS PROJECT.

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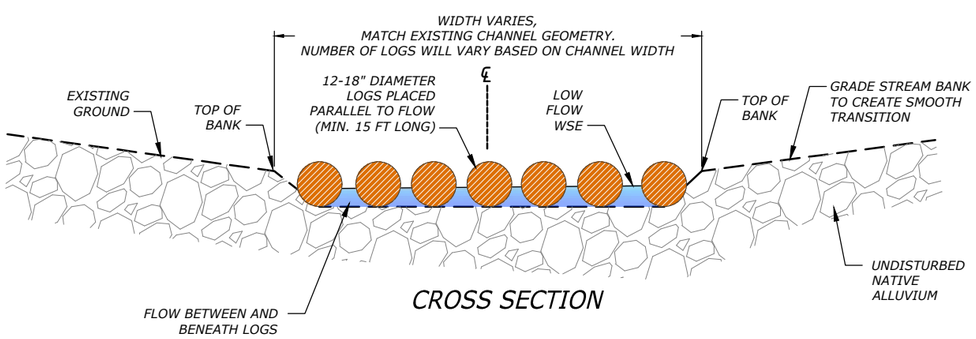
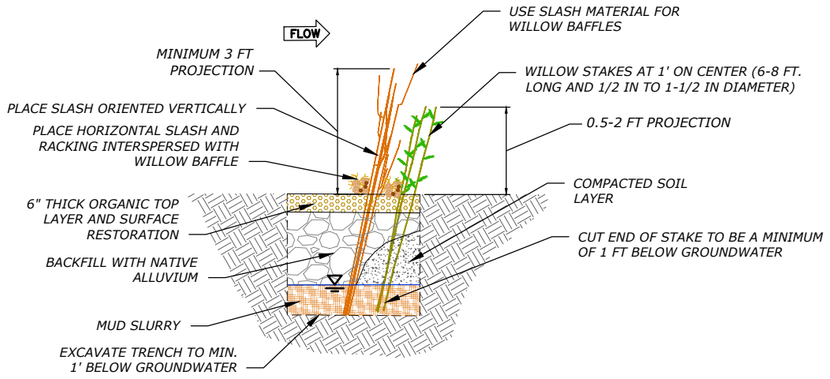


TEMPORARY LOG CROSSING NOTES

1. CREATE SMOOTH TRANSITION TO ADJACENT EXISTING GRADES BY GRADING STREAM BANK AS NECESSARY.
2. INSTALL TEMPORARY LOG CROSSING AT LOCATIONS SHOWN IN THE PLANS OR DETERMINED BY THE OWNER OR ENGINEER. TEMPORARY LOG CROSSING REQUIRED IN CHANNELS WITH PERENNIAL FLOW OR WHEN VISIBLE SURFACE FLOW PRESENT IN NON-PERENNIAL CHANNELS.
3. TEMPORARY LOG CROSSING TO BE REMOVED DURING ACCESS ROUTE CLOSURE PER PLANTING AND SEEDING PLAN.

5 **TEMPORARY LOG CROSSING**
NTS



APPLICATIONS AND EFFECTIVENESS:
- APPLICABLE ON AREAS THAT LACK VEGETATION ON THE FLOODPLAIN.
- ADJACENT TO PERMANENT OR INTERMITTENT STREAMS, WETLANDS AND AREAS WITH GROUND WATER RECHARGE.
- UNSTABLE AREAS SUCH AS THOSE WITH HIGH SURFACE EROSION RATES AND MASS SOIL MOVEMENT WILL REQUIRE STABILIZATION PRIOR TO ESTABLISHMENT OF VEGETATION.
- TOLERANT PLANT SPECIES AND SUPPLEMENTAL WATERING MAY BE NEEDED IN SOME AREAS.

DESIGN INTENT:
- INCREASES RATE OF COLONIZATION OF NATIVE SPECIES.
- CREATE LONG TERM FLOODPLAIN STABILITY THROUGH REDUCED FLOODPLAIN VELOCITIES, PROMOTE SEDIMENT COLLECTION, AND PROVIDE HYDRAULIC REFUGE FOR PLANTS.

DESIGN CONSIDERATIONS:
- UTILIZE NATIVE SPECIES AND ENSURE ACCESS TO WATER.

FLOODPLAIN WILLOW BAFFLE IMMEDIATELY AFTER INSTALLATION (LEMHI RIVER, ID)

6 **WILLOW BAFFLE**
NTS

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D2
SHEET 26 OF 33

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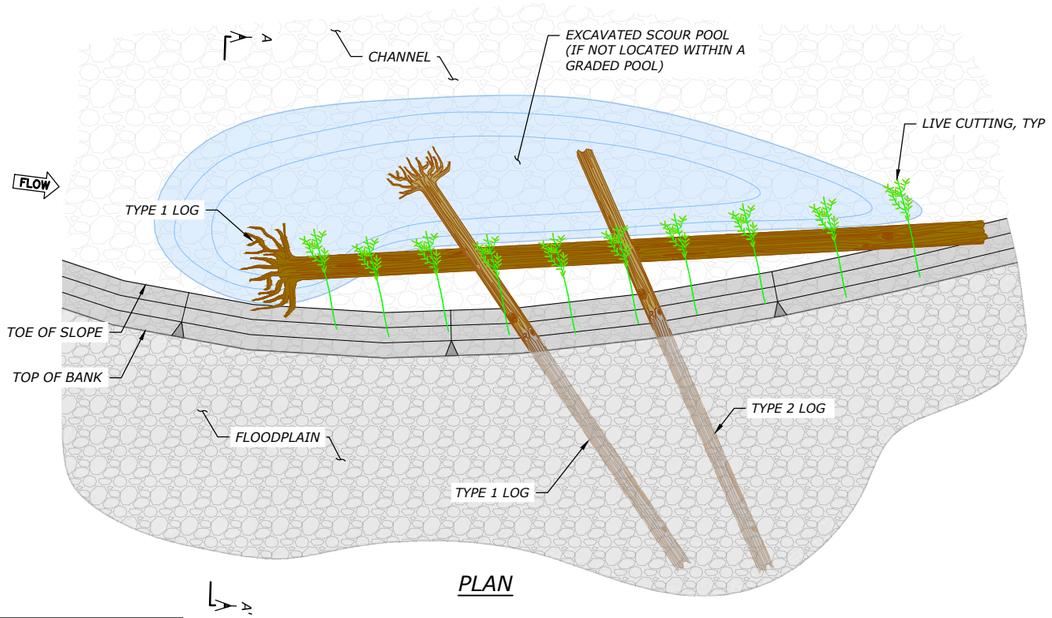
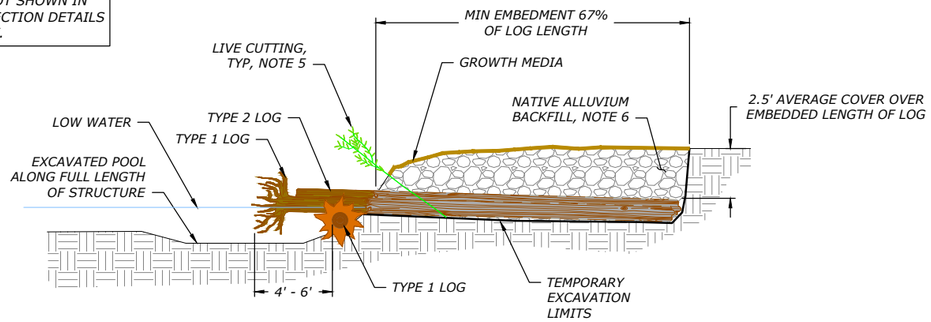


PLAN

NOTE: RACKING AND SLASH MATERIAL NOT SHOWN IN PLAN AND SECTION DETAILS FOR CLARITY.



SECTION A-A'

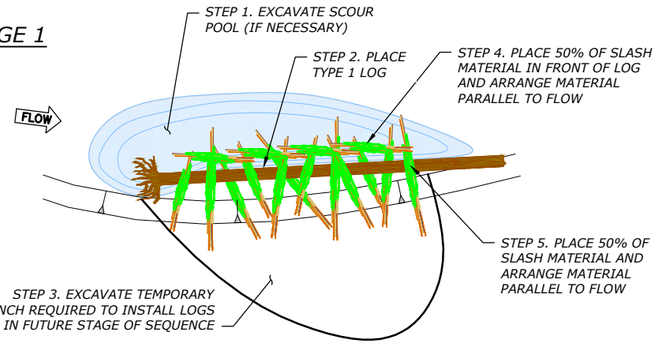
NOTES:

1. STRUCTURE LOCATIONS SHOWN IN THE PLANS ARE APPROXIMATE. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE APPROVED BY THE CONTRACTING OFFICER PRIOR TO INSTALLATION.
2. IF POOL EXCAVATION IS NOT SPECIFIED IN THE GRADING PLAN, THE CONTRACTING OFFICER WILL DETERMINE IF A SCOUR POOL IS DESIRED. THE SCOUR POOL SHALL BE EXCAVATED TO A DEPTH OF 2' ADJACENT TO THE STRUCTURE AND EXTEND BEYOND ROOTWADS EXTENDING INTO CHANNEL PER THE DIRECTION OF THE CONTRACTING OFFICER.
3. ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING CONSTRUCTION OF RIFFLES OR STREAMBED MATERIALS.
4. RACKING, SLASH, AND LIVE STAKES SHALL BE INCORPORATED INTO THE STRUCTURE BY WEAVING THE MATERIAL IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER. RACKING CAN BE PLACED FIRST TO LIFT THE LOG OFF CHANNEL BED AS DIRECTED BY THE CONTRACTING OFFICER. SEE STRUCTURE SEQUENCING FOR RACKING AND SLASH PLACEMENT.
5. LIVE STAKES SHALL BE INSTALLED PRIOR TO AND/OR DURING BACKFILLING TO ENSURE A MINIMUM OF 1-FT SUBMERGENCE IN GROUND WATER. LIVE STAKES SHALL HAVE CONTINUOUS CONTACT WITH SOIL ALONG THE LENGTH OF THE STAKE LEAVING NO VOIDS.
6. BACKFILL USING NATIVE EXCAVATED MATERIAL UNLESS NATIVE MATERIAL IS UNSUITABLE. UNSUITABLE IS DEFINED AS ANYTHING CLASSIFIED AS A CLAY, SILT, OR SAND. PLACE BACKFILL IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE MATERIAL DURING COMPACTION.
7. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
8. LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.

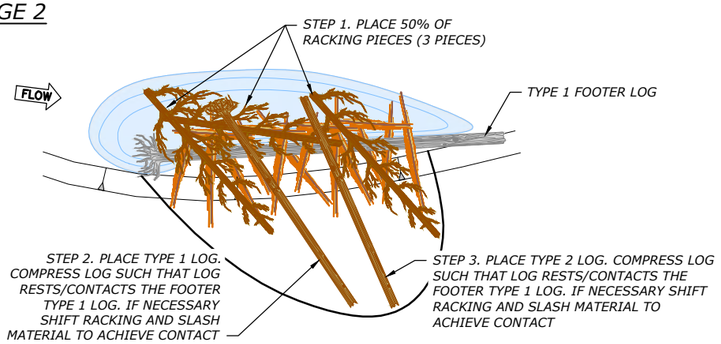
7 HS-1 THREE LOG STRUCTURE
NTS

STRUCTURE SEQUENCING

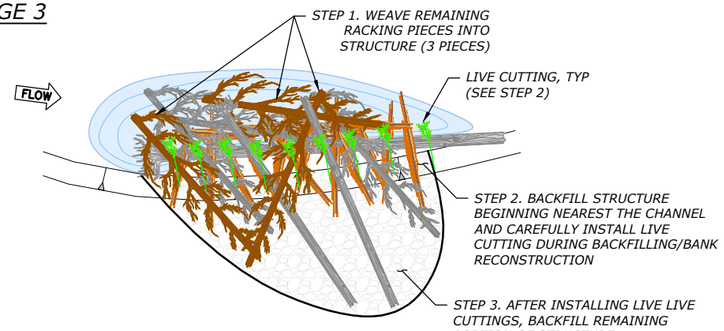
STAGE 1



STAGE 2



STAGE 3



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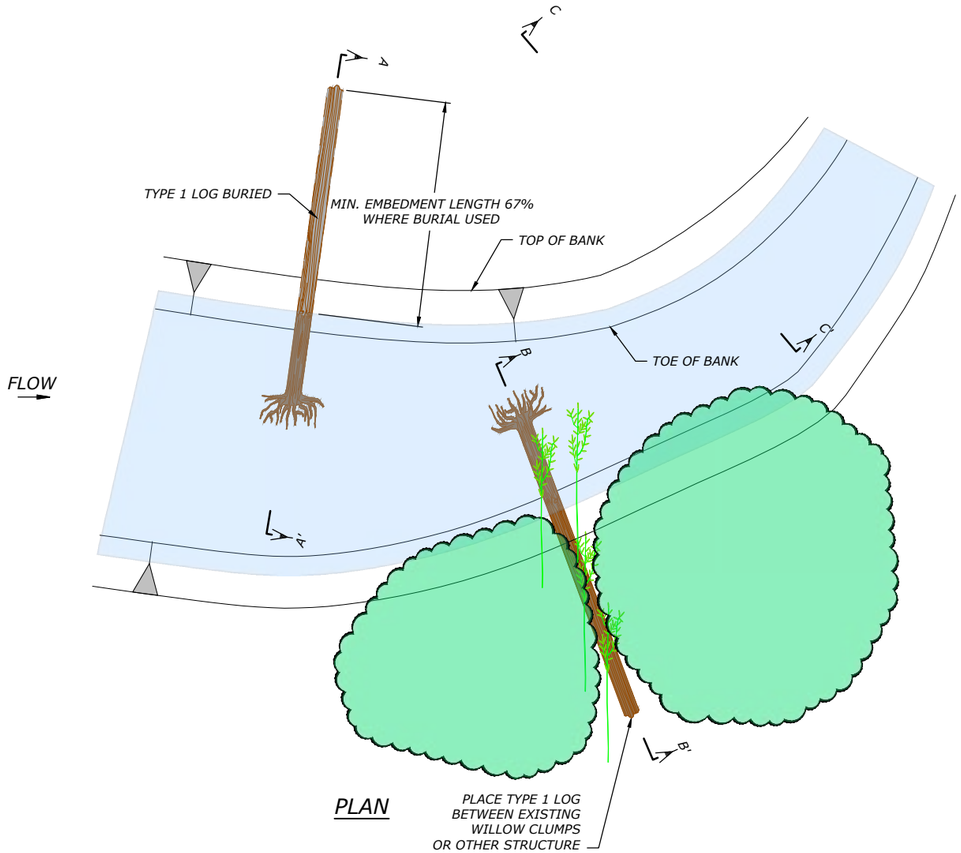
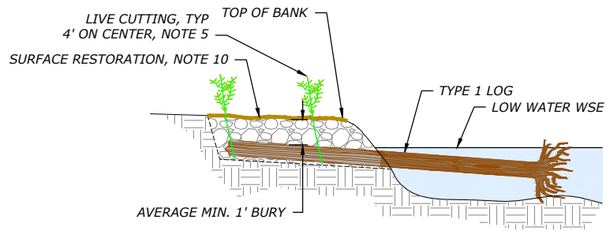
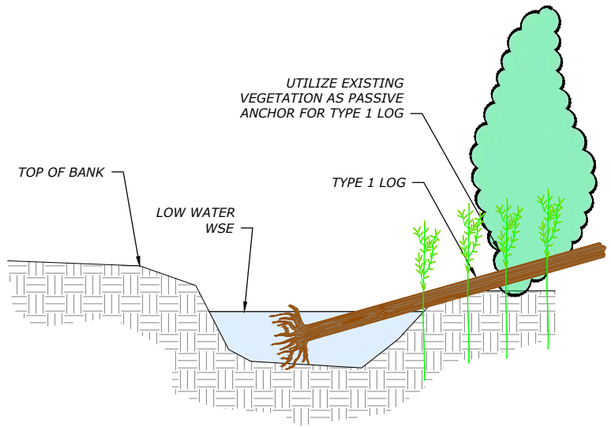


PLAN



SECTION VIEW A-A' (BURIED)



SECTION VIEW B-B' (ON SURFACE)

NOTES:

1. STRUCTURE LOCATIONS SHOWN IN PLANS ARE APPROXIMATE.
2. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE LOCATED PRIOR TO INSTALLATION FOR APPROVAL BY THE CONTRACTING OFFICER.
3. ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING RIFFLE CONSTRUCTION AND PLACEMENT OF BAR MATERIAL.
4. SEE STRUCTURE SCHEDULE FOR NUMBER OF STRUCTURES, LOCATIONS, LOGS, AND ASSOCIATED MATERIAL QUANTITIES.
5. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
4. RACKING, SLASH, AND LIVE STAKES SHALL BE INCORPORATED INTO THE STRUCTURE WHILE PLACING LAYERS SUCH THAT IT IS WOVEN INTO STRUCTURE IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER.
5. WHEN EXCAVATED INTO GROUND, BACKFILL USING NATIVE EXCAVATED MATERIAL UNLESS NATIVE MATERIAL IS UNSUITABLE FOR BACKFILL. PLACE BACKFILL IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING.
6. WHEN UTILIZING EXISTING VEGETATION AS PASSIVE ANCHORS THERE SHALL BE AT A MINIMUM A WILLOW CLUMP ON THE DOWNSTREAM SIDE, BUT PREFERABLY ON THE UPSTREAM SIDE AS WELL. THE CONTRACTING OFFICER SHALL AGREE TO PLACEMENT AREAS OF STRUCTURES THAT ARE NOT BURIED.
7. LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.

8 HS-2 SINGLE LOG STRUCTURE
NTS

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DETAILS - 4

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D4
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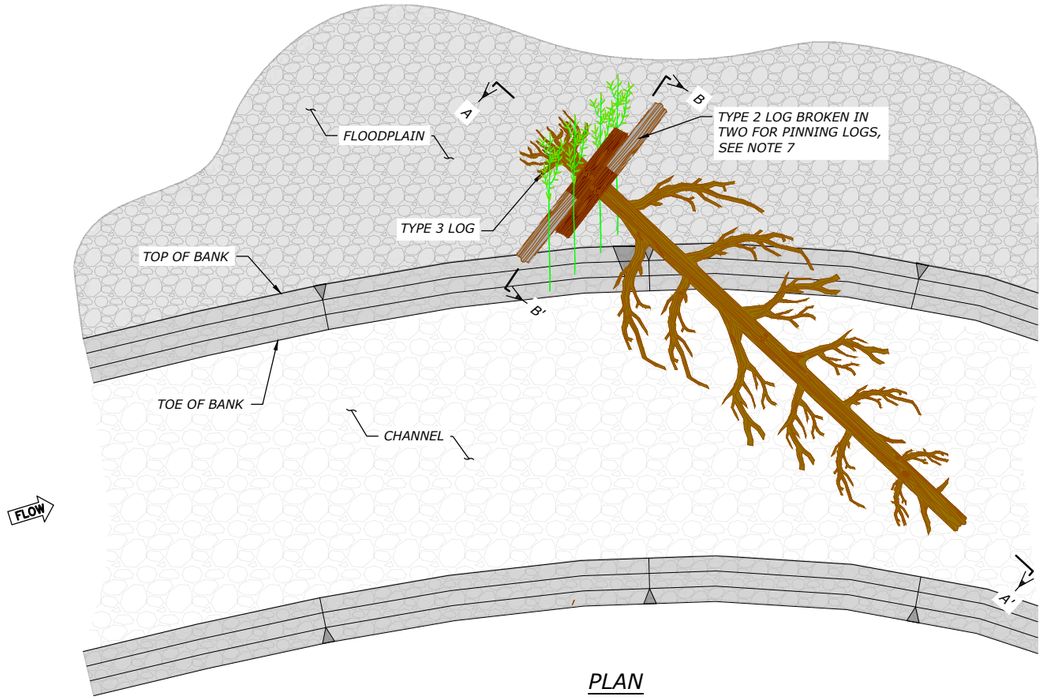
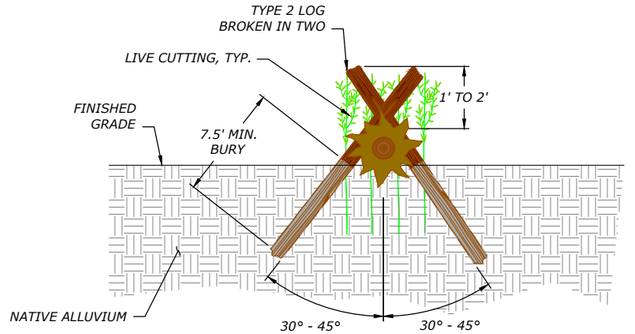
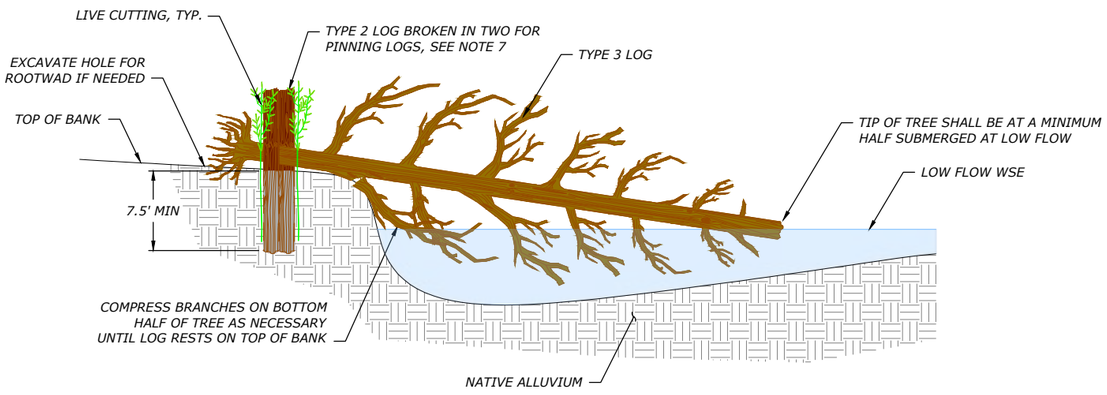


PLAN



SECTION B-B'

NOTES:
1. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.



SECTION A-A'

NOTES:
1. STRUCTURE LOCATIONS SHOWN IN PLANS ARE APPROXIMATE. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE LOCATED PRIOR TO INSTALLATION FOR APPROVAL BY THE CONTRACTING OFFICER.
2. ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING RIFFLE CONSTRUCTION AND PLACEMENT OF BAR MATERIAL.
3. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
4. TYPE 3 LOG SHALL BE HANDLED A MINIMUM NUMBER OF TIMES TO REDUCE LOSS OF LIMBS, FOLIAGE, ETC.. IF MORE THAN 15% OF TREE BRANCHES ARE REMOVED OR DAMAGED DURING HANDLING THE CONTRACTOR SHALL REPLACE AT NO COST TO THE SPONSOR.
5. SLASH MATERIAL SHALL BE INCORPORATED INTO THE STRUCTURE BY PLACING IT UPSTREAM OR UNDER TYPE 3 LOG, AS DIRECTED BY THE CONTRACTING OFFICER.
6. LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.
7. PINNING LOGS TO BE DRIVEN. IF PINNING LOGS ARE UNABLE TO BE DRIVEN DUE TO SHALLOW BEDROCK, THE STRUCTURE MAY BE BALLASTED USING BOULDERS.

9 HS-3 WHOLE TREE STRUCTURE
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D5
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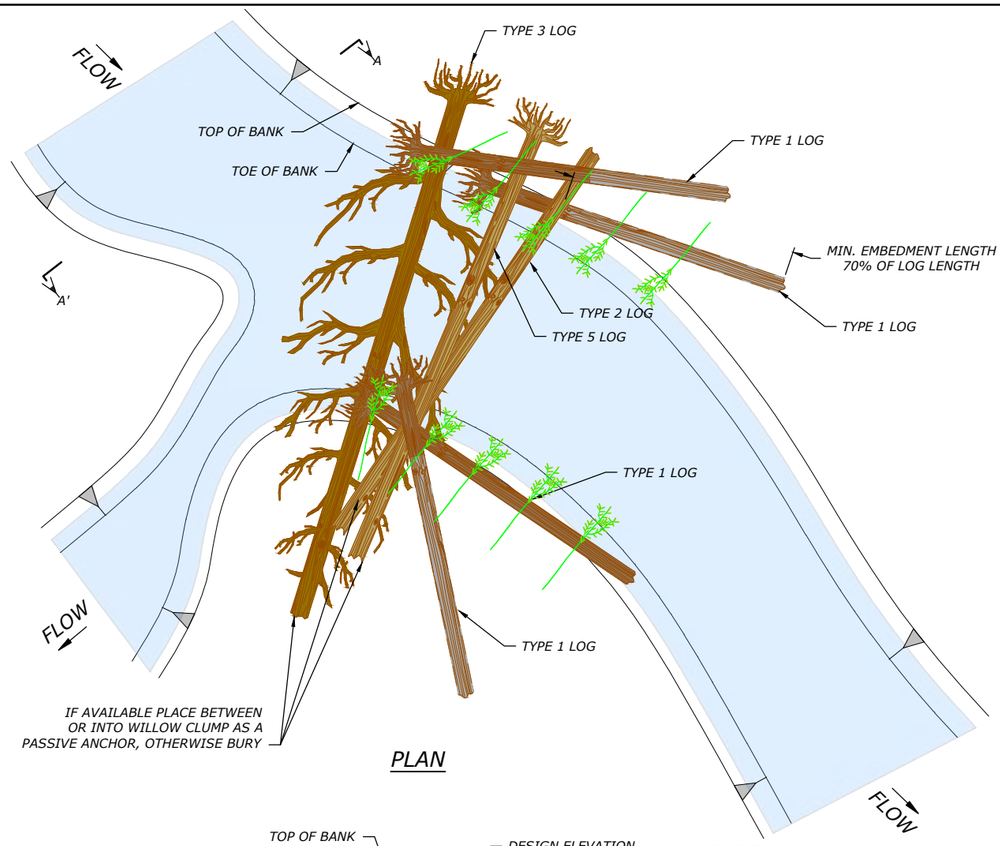
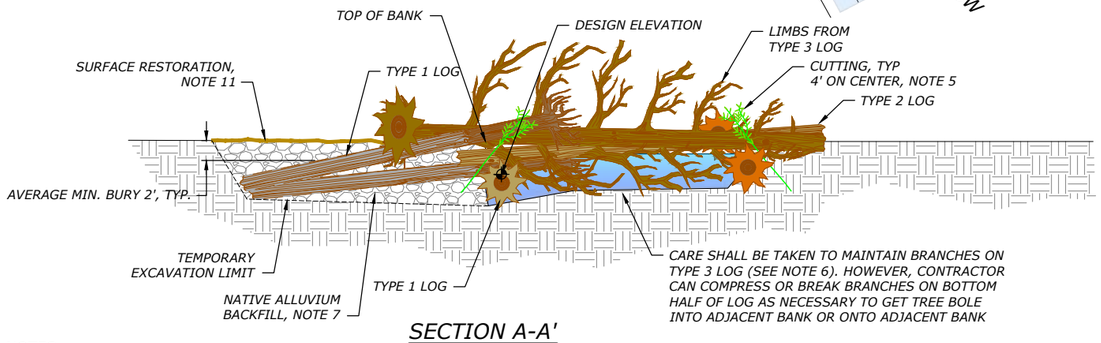
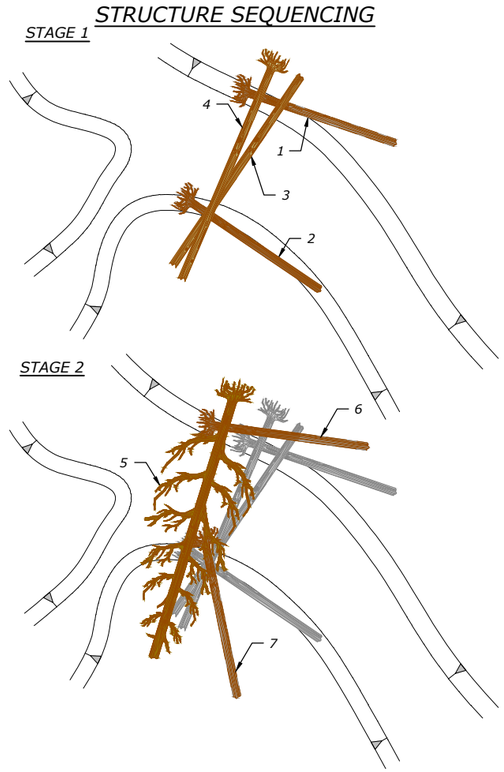


PLAN



SECTION A-A'

STRUCTURE SEQUENCING



NOTES:

1. STRUCTURE LOCATIONS SHOWN IN THE PLANS ARE APPROXIMATE.
2. THE EXACT LOCATION OF STRUCTURE SHALL BE LOCATED PRIOR TO INSTALLATION FOR APPROVAL BY THE CONTRACTING OFFICER.
3. ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING RIFFLE CONSTRUCTION AND PLACEMENT OF BAR MATERIAL.
4. SEE STRUCTURE SCHEDULE FOR NUMBER OF STRUCTURES, LOCATIONS, LOGS, AND ASSOCIATED MATERIAL QUANTITIES.
5. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO OR UPON COMPLETION OF INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
6. TYPE 3 LOG SHALL BE HANDLE DIRECTLY TO REDUCE LOSS OF LIMBS, FOLIAGE, ETC.. IF MORE THAN 15% OF TREE BRANCHES ARE REMOVED OR DAMAGED DURING HANDLING THE CONTRACTOR SHALL REPLACE AT NOT COST TO THE CONTRACTING AGENCY.
7. RACKING AND SLASH MATERIAL SHALL BE INCORPORATED INTO THE STRUCTURE WHILE PLACING LAYERS SUCH THAT IT IS WOVEN INTO STRUCTURE IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER.
8. BACKFILL USING NATIVE EXCAVATED MATERIAL UNLESS NATIVE MATERIAL IS UNSUITABLE. UNSUITABLE MATERIAL CLASSIFIES AS A CLAY, SILT OR SAND. PLACE BACKFILL AS STRUCTURE IS CONSTRUCTED IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE MATERIAL DURING COMPACTION.
9. WHEN UTILIZING EXISTING VEGETATION AS PASSIVE ANCHORS THERE SHALL BE AT A MINIMUM A WILLOW CLUMP ON THE DOWNSTREAM SIDE, BUT PREFERABLY ON THE UPSTREAM SIDE AS WELL.
10. LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.

10 HS-4 BLEEDER JAM STRUCTURE
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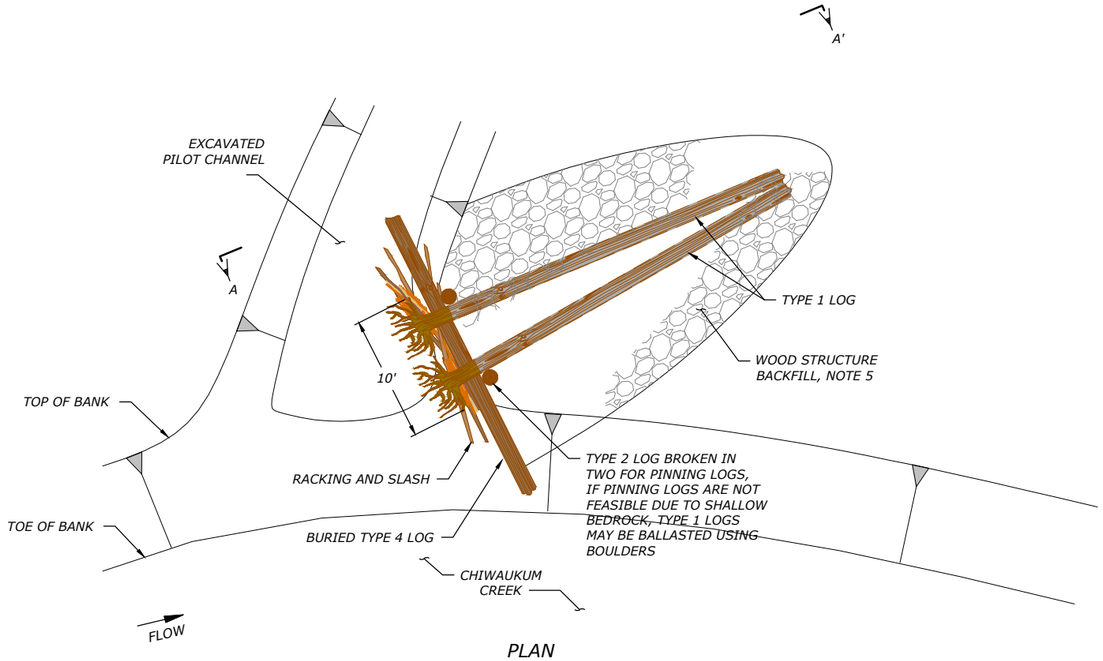
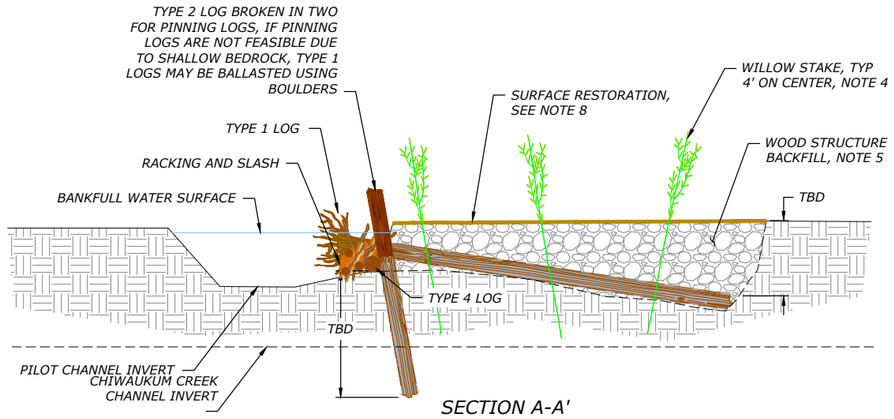


PLAN



SECTION A-A'

11 HS-5 SMALL APEX JAM
NTS

NOTES:

1. INSTALL STRUCTURES AT LOCATIONS IDENTIFIED IN THE PLANS. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE STAKED PRIOR TO INSTALLATION FOR APPROVAL BY THE CONTRACTING OFFICER.
2. ROUGH GRADING OF PILOT CHANNEL SHALL BE COMPLETE PRIOR TO INSTALLATION OF LOGS.
3. RACKING, SLASH, AND LIVE STAKES SHALL BE INCORPORATED INTO THE STRUCTURE BY WEAVING IT IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER.
4. LIVE STAKES SHALL BE INSTALLED PRIOR TO AND/OR DURING BACKFILLING TO ENSURE A MINIMUM OF 1-FT SUBMERGENCE IN GROUND WATER. LIVE STAKES SHALL HAVE CONTINUOUS CONTACT WITH SOIL ALONG THE LENGTH OF THE STAKE LEAVING NO VOIDS.
5. BACKFILL USING SPECIFIED WOOD STRUCTURE BACKFILL MATERIAL. NATIVE EXCAVATED MATERIAL MAY BE USED AS WOOD STRUCTURE BACKFILL MATERIAL IF IT MEETS THE REQUIRED GRADATION. PLACE BACKFILL IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE.
6. ALL EXPOSED ENDS OF LOGS SHALL BE BROKEN AND NOT SAW CUT TO APPEAR NATURAL.
7. LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.
8. REPLACE ORGANIC LAYER AND/OR PREPARE SURFACE FOR SEEDING IN ACCORDANCE WITH THE PLANTING AND SEEDING PLAN AND/OR SPECIFICATIONS.

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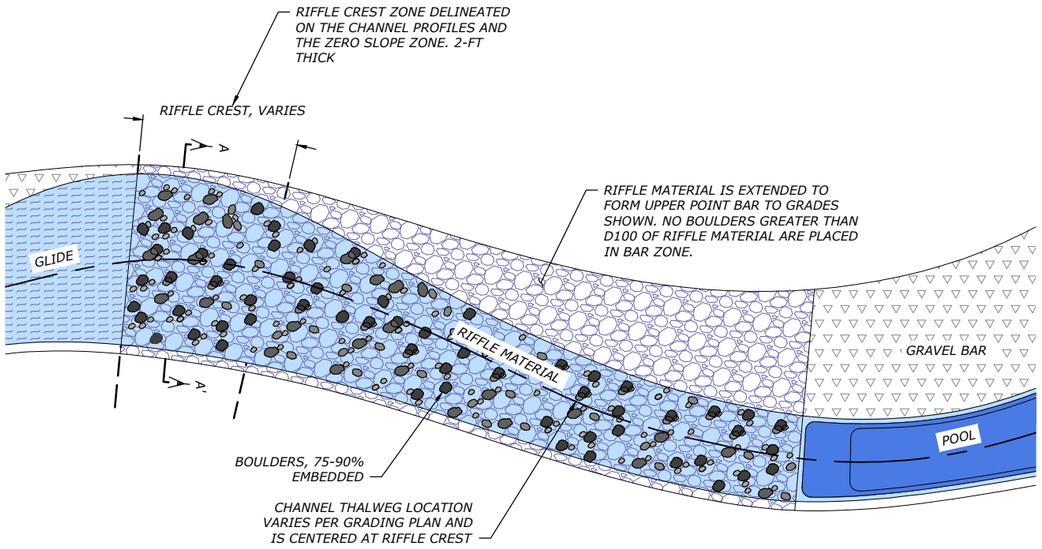
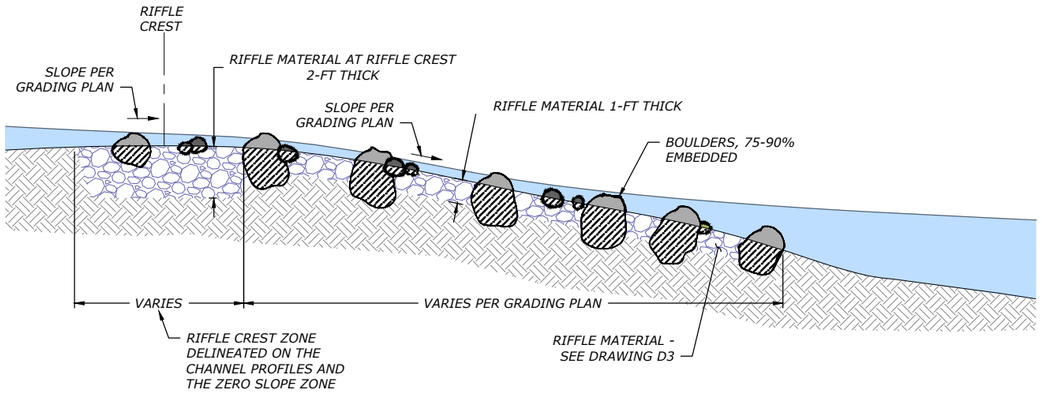
RIFFLE OVERVIEW NOTES:

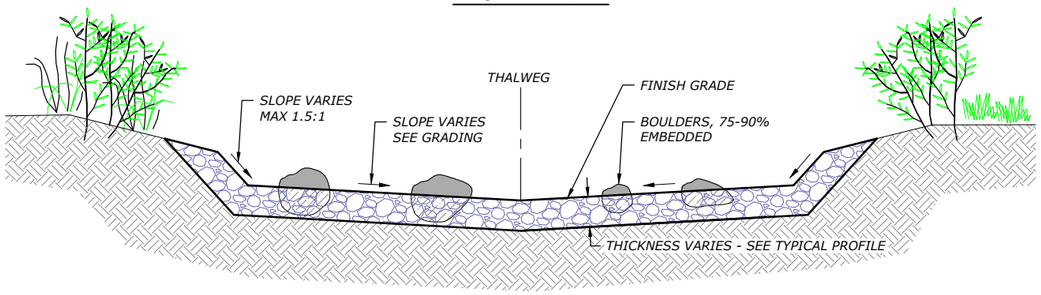
CONSTRUCTED RIFFLES ARE TO BE INSTALLED AT LOCATIONS SHOW IN THE PLANS. RIFFLES SHALL BE OVER EXCAVATED AND REPLACED UNLESS DIRECTED BY ENGINEER.



PLAN



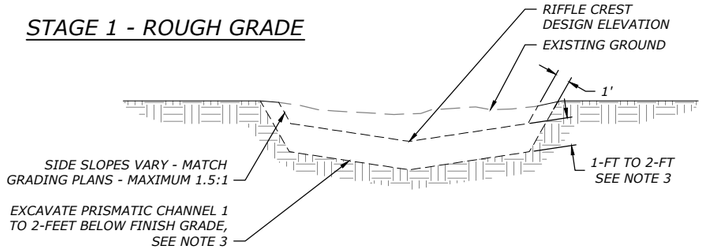
PROFILE VIEW



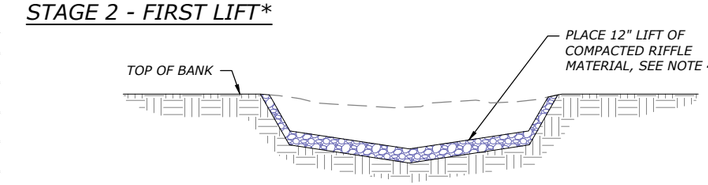
SECTION A-A'

CONSTRUCTION SEQUENCING

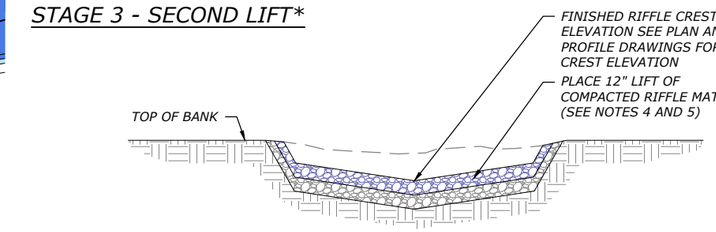
STAGE 1 - ROUGH GRADE



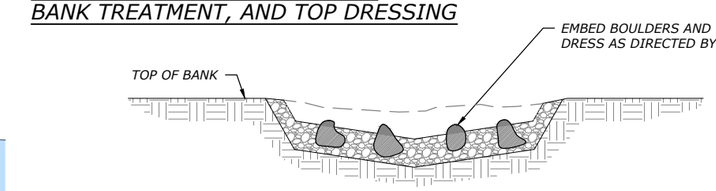
STAGE 2 - FIRST LIFT*

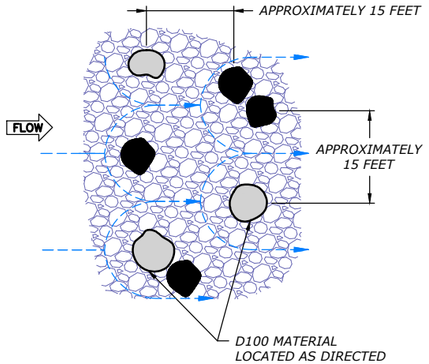


STAGE 3 - SECOND LIFT*



STAGE 4 - BOULDER PLACMENT, BANK TREATMENT, AND TOP DRESSING





BOULDER PLACEMENT

CONSTRUCTED RIFFLE NOTES:

1. STOCKPILE CHANNEL MATERIALS PER DESIGN SPECIFICATIONS. MATERIALS ARE TO BE STOCKPILED IN THE IMMEDIATE PROJECT AREA OR TRANSPORTED FROM THE SORTING AREA AS NEEDED.
2. THREE PLACEMENTS ARE REQUIRED AS FOLLOWS:
   - 2.1. CONSTRUCTED RIFFLE MATERIAL
   - 2.2. LARGE AND SMALL BOULDERS (FOR EMBEDMENT)
   - 2.3. ROUGHNESS ROCK (TOP DRESSING)
3. TREAT EXISTING CHANNEL BED BY REMOVING ORGANICS AND CREATING A PRISMATIC WORKING SURFACE FOLLOWING CHANNEL THALWEG AND DESIGN CONTOURS ON GRADING DRAWINGS. ROUGH GRADE FROM FINISH GRADE TO SPECIFIED RIFFLE MATERIAL DEPTH IN CHANNEL BED IN ACCORDANCE WITH PLAN AND PROFILE DRAWINGS. ROUGH GRADE BANKS BY 1-FT TO SLOPES SHOWN ON GRADING PLANS AND NOT EXCEEDING 1.5:1.
4. RIP EXISTING CHANNEL BED AT MINIMUM 1" DEEP TO CREATE A BETTER BONDING SURFACE BETWEEN THE TWO LAYERS.
5. IMPORT WELL-MIXED RIFFLE MATERIAL AND/OR CREATE MATERIAL FROM NATIVE ALLUVIUM FROM PROJECT EXCAVATIONS MEETING THE SPECIFICATIONS FOR CONSTRUCTED RIFFLE MATERIAL. COMPACT RIFFLE MATERIAL IN 12-INCH LIFTS USING TRACKED 300 SERIES EXCAVATOR, OR SIMILAR EQUIPMENT AS APPROVED BY C.O. TRACK ON MATRIX MATERIAL SUFFICIENTLY TO COMPACT MATERIAL.
6. REPEAT RIFFLE CONSTRUCTION BY PLACING ANOTHER 12-INCH LIFT WHERE REQUIRED TO MEET DESIGN FG AND CROSS SECTION SHAPE.
7. BOULDERS OF VARIOUS SIZES ARE TO BE ADDED TO THE RIFFLE TO CREATE DIVERSE FLOW PATHS AND HABITAT.
8. TOP DRESS WITH COARSE RIFFLE MATERIAL AS NEEDED AND DIRECTED BY C.O. TO ADD SOME INITIAL ROUGHNESS TO THE CHANNEL AND FORM A NATURAL APPEARANCE.
9. FOR THOSE AREAS WHERE HABITAT STRUCTURES OR BANK TREATMENTS ARE TO BE PLACED ADJACENT TO THE CONSTRUCTED RIFFLE, THE RIFFLE WILL BE CONSTRUCTED BEFORE PLACEMENT OF HABITAT STRUCTURES OR BANK TREATMENTS.
10. RIFFLES AND CHANNELS THAT ARE MARKED AS COMPLETE BY THE CONTRACTOR SHALL NOT BE DRIVEN ON BY MACHINERY TO PREVENT OVER COMPACTION OR MOVEMENT OF MATERIAL WITHOUT APPROVAL FROM C.O..

12 CONSTRUCTED RIFFLE
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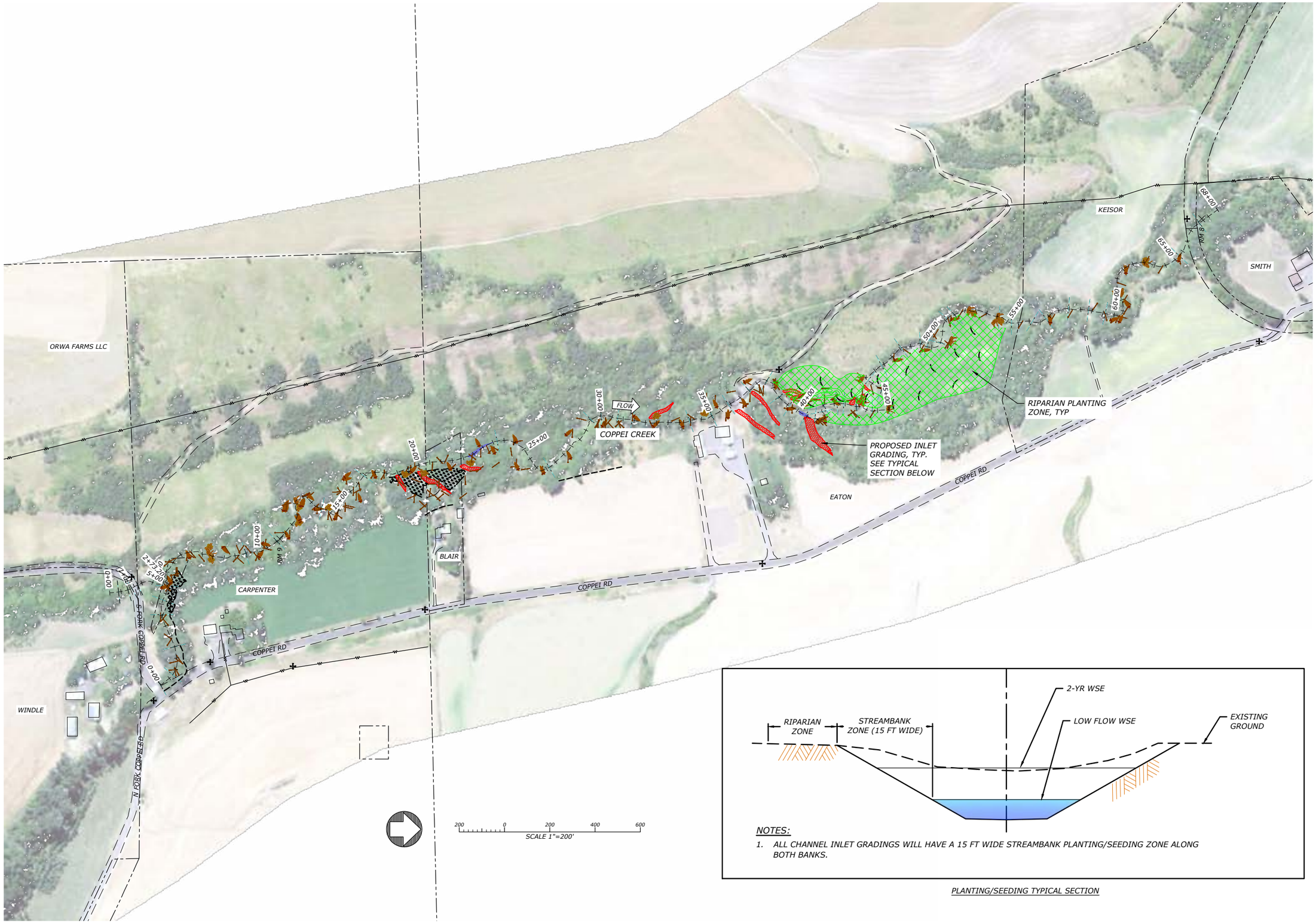

NOTES:

1. ALL CHANNEL INLET GRADINGS WILL HAVE A 15 FT WIDE STREAMBANK PLANTING/SEEDING ZONE ALONG BOTH BANKS.

PLANTING/SEEDING TYPICAL SECTION

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PLANTING

PLANTING & SEEDING PLAN

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